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TEETOR'S QUICK ADJUSTABLE DIAMOND MILLSTONE DRESSERS.

WHEN all the flour was ground on stones, millstone dressing was looked upon as an art and millers took a great deal of pride in the exhibition of their ability to dress the buhrs. The introduction of roller milling has rather pushed the stone dresser as well as the stone into the background, and yet they are more necessary to each other to-day than they were in the days of the old milling systems, because the stone flour has now to compete with the roller flour and a perfect millstone dressing is now a more important factor in the production of high grade flours than ever before. It seems that almost all the inventive genius of the age has expended itself in the improvements of roller mills, and that the buhr stones have been neglected for their more prosperous rivals, the rollers.

And yet there are thousands of buhr-runs yet in operation in this country and any improvement, which can increase their efficiency quantitative or qualitative, must be of importance to a large number of the millers throughout the United States and Canada. We illustrate to-day two machines well-known on the market under the name of "Teetor's quick adjustable diamond millstone dresser." One of these, the "A" machine, measures 29 inches long over all, 18 inches wide, weighs 150 pounds, same width carriage as the B machine, and the "B" machine 33 inches long over all, 19 inches wide, weighs 170 pounds, manufactured by Chas. A. Bertsch, of Cambridge City, Ind., which stands very close to the head of millstone dressing devices. It has an automatic feed, which is a new invention, and is a revolution compared with the screw feed, and no less so as to the adjustment. The operator has at all times full control of the rod feed, to regulate it—to cut fine or coarse, while in motion. This feed is regulated as desired, by the slight turn of a hand wheel on the left, as indicated, which has simply an eccentric pin underneath, with a plain wheel on said pin, to give an easy motion to the double cam shaped lever which is attached to the rod. By operating the carriage, the rod will oscillate back and forth, as the feed is set by said hand wheel. By turning said hand wheel half way round from the carriage, it will clear said lever and not feed any, if so desired, in case of adjusting the guide plate to the face or furrow. There is nothing which can get out of order; it reverses instantly, works right and left, fine or coarse, without any extra attachments. It will cut any number of cuts per inch, from ten to one thousand; is adapted to deep facing, and better than anything else to the facing of uneven surfaces such as high or hard places where a fine feed is required. The feed is instantly reversed to cut right or left while in motion and by the use of the automatic rod feed it is not possible for any lost motion laterally as with a screw-feed. By the use of this rod feed the cross head can be pushed by hand to either side of the carriage for quick operation, thus making the feed self-acting or reversing. It can be adjusted accurately with ease and without any tools, and the large tilting plate can be placed at any practical angle to furrow or

bosom as desired. The carriage is made in one solid piece with adjustable brass gibbs. All the gibbs are long and self-adjusting by the slight turn of a screw. Gibs and cross-head are made of brass. The machines are long and extra wide, and can be placed over the spindle or shaft in use. The facing can be done with two diamonds at one time and the diamond holder is so constructed that it holds diamonds of any shape firmly. The carriage can be taken out and replaced in less than half a minute, making it more convenient to set the diamonds and to wipe the ways and gibbs. The manufacturer claims that this is the best and most complete millstone dresser ever built, and is willing to guarantee every machine sold to perform the work as represented.

LESSONS FROM EXPERIMENTAL WHEAT GROWING.

The Rothamsted experimental farm in England is everywhere looked upon as one of the most reliable sources for the deter-

mination of questions relating to agriculture, and the conclusions arrived at by its directors from experiments in continuous wheat growing extending over a term of forty years, are well worthy of the widest possible circulation, and we take them as contributed to the Royal Agricultural Society's Journal, by Sir John B. Lawes and Dr. Gilbert.

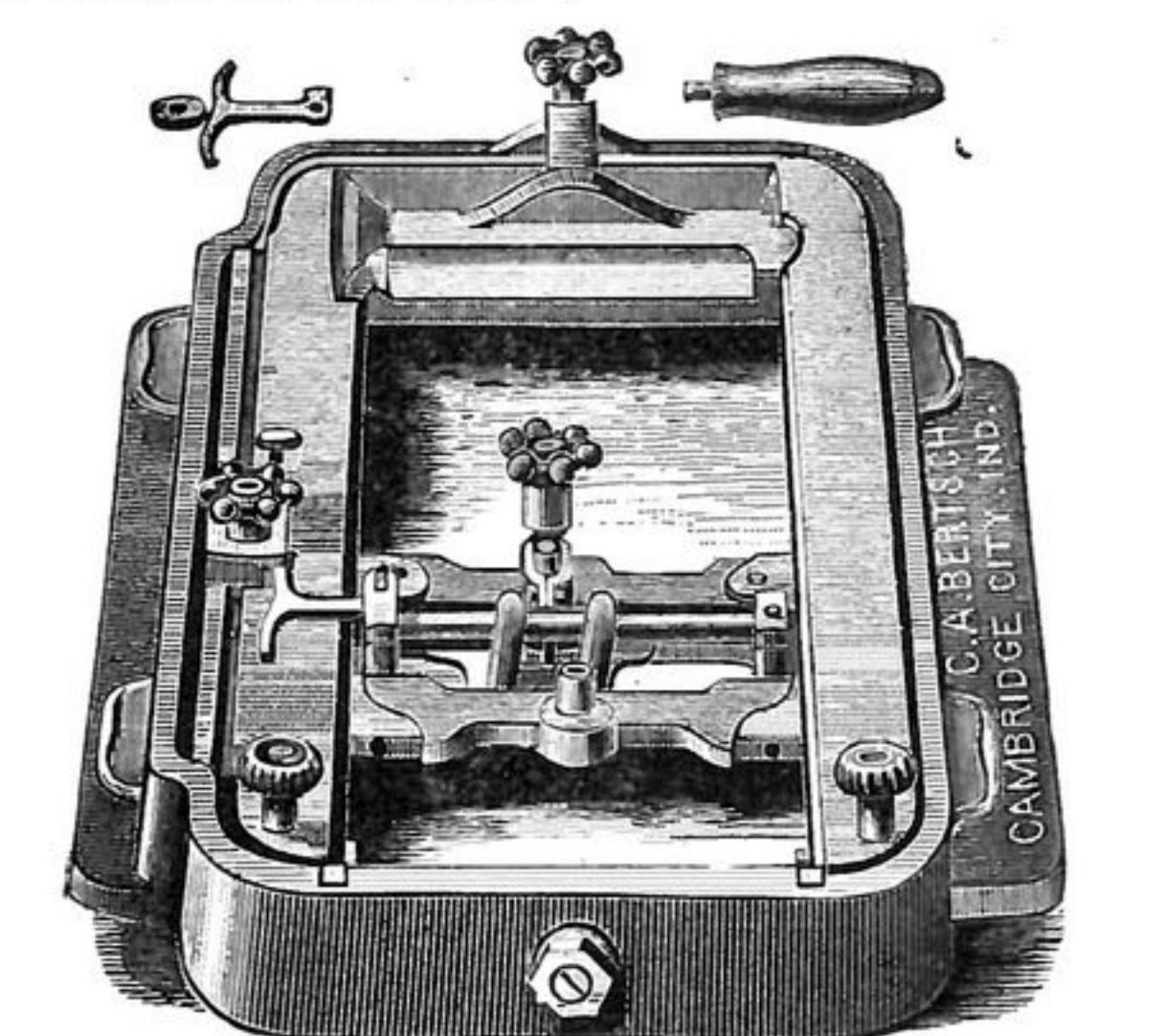
MANURES.

1. Mineral manures alone have added very slightly to the produce grown upon the unmanured land. 2. Manures containing

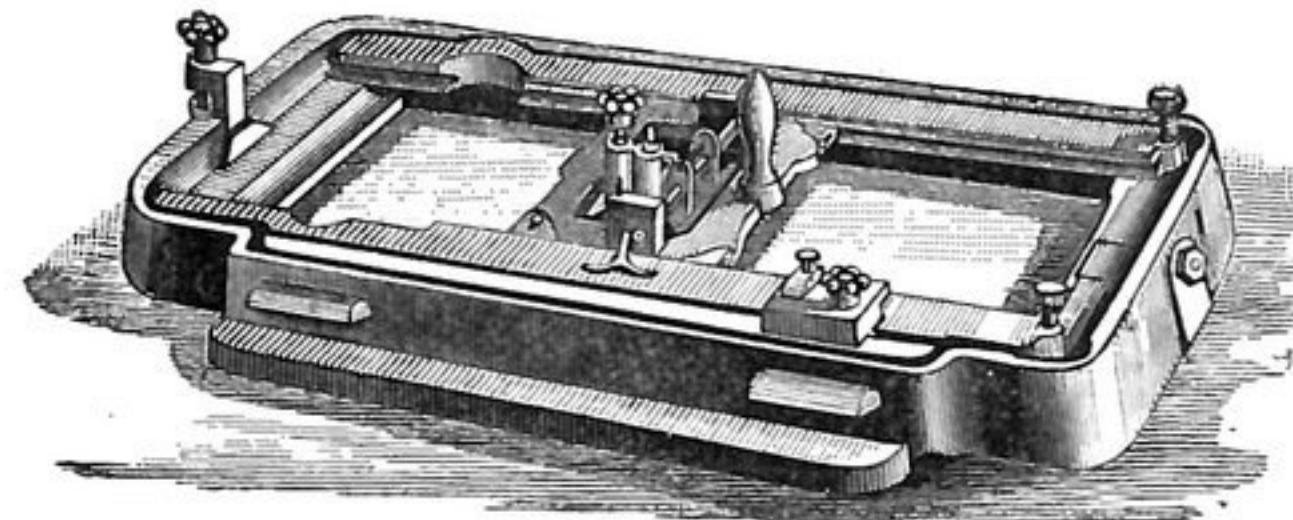
is not in an active form. 9. A given weight of nitrogen, in the form of nitric acid, will produce more growth in the crop to which it is applied, than the same weight of nitrogen in dung; but the influence of the nitrate upon succeeding crops will be very much less. 10. There is no evidence to show whether the whole available effect of the nitrogen in one manure is greater than it is in the other.

UNEXHAUSTED MANURES.

1. In the absence of vegetation, or when applied to crops in excess of their requirement, both potash and phosphoric acid form insoluble compounds with the soil and become available for future crops. 2. In the absence of vegetation, or when the amount supplied is in excess of the requirements of the crop, nitrates and salts of ammonia do not appear to form permanent compounds with the soil, but, on the contrary, are liable to be washed out by rain, or to be otherwise lost. 3. The application of a larger amount of nitrogen, as nitrates or salts of ammonia, than the crop could utilize, owing to a want of minerals, does not appear to prevent the nitrification of the organic nitrogen of the soil. 4. The stock of nitrogen of the soil itself, therefore, may be reduced, although the annual application of nitrogen may be much in excess of that substance removed in the crop. 5. When large crops of wheat have been grown by the application of nitrates, or salts of ammonia with mineral manures, the soil does not appear to have gained or lost fertility. Nitrification of the organic matter in the soil may have gone on as usual, but the loss has been made good by the amount of nitrogen stored up in the stubble and underground roots of the large crops previously grown. 6. When dung is applied continuously to land, the accumulation of unexhausted fertility becomes very large, and the removal by crops of the substance accumulated, would extend over a long series of years. 7. Dung applied to land in the ordinary processes of agriculture, will not be entirely exhausted until a considerable number of years have elapsed from the time of its first application.



"A" MACHINE.



"B" MACHINE.

TEETOR'S QUICK ADJUSTABLE DIAMOND MILLSTONE DRESSER.

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THE SOIL.

1. A soil which in the ordinary course of agriculture would have received an application of manure before another crop was sown, has produced forty crops of wheat in succession, averaging 14 bushels per acre, solely by means of its existing fertility. 2. At the commencement of the experiment, the soil contained a large amount of organic nitrogen, derived from the debris of pre-existing vegetation. It also contained a large amount of the mineral food of plants. 3. Every year a certain proportion of the organic nitrogen has been nitrified by organisms existing in the soil. 4. Part of the nitrates formed has been employed in the growth of the wheat crop; part has been wasted out of the soil or otherwise lost.

nitric acid alone, or some compound of nitrogen which is easily nitrified, have considerably increased the crop. 3. The soil therefore contained a stock of minerals which the wheat crop was unable to make use of, owing to the insufficient supply of nitrogen in some available form. 4. Manures consisting of potash, phosphoric acid, and ammonia or nitrates, appear competent to grow large crops of wheat continuously. 5. A given weight of nitrogen as nitric acid has produced more growth in the wheat crop than the same weight of nitrogen in salts of ammonia. 6. The amount of nitrogen supplied in manures is very much in excess of the amount recovered in the increase of the crop. 7. After a certain amount of growth has been reached, each increase of crop requires a proportionately larger application of manure. When the price of grain is high, larger crops can be grown more profitably than when the price is low. 8. When farmyard dung is employed to grow wheat, a considerably larger amount of nitrogen must be applied to produce a given increase in the crop, as much of the nitrogen contained in the dung

THE NUTRITIVE VALUE OF FOOD.

From Oesterr.-Ungar. Mueller.

To facilitate a better understanding about the chemical composition of the different food materials, Prof. Koenig, of the university of Munster, Germany, has recently compiled a series of tables, exhibiting figures which reduce the nutritive value of each separate ingredient to a uniform scale, and which give the money value of each. This latter point is of special interest, as it gives the exact data of the value of a certain amount of money when expended for foods of different quality and composition. The principal constituents of human food are nitrogenous substances, fats and carbohydrates or starches. In order to be of the greatest benefit to the human body, these substances have to be taken, not only in sufficient quantities, but also in the proper proportions. The nitrogenous substances are of the utmost importance in the nutrition of the human body; blood, tissues and organs are built up and nourished by them; they are constantly changing and decomposing, and consequently a fresh supply has to be

ingested at certain times in order to supply the waste.

The fats of the food are either stored up in the human body as such, or else, under combination with the atmospheric oxygen, they split up into carbonic acid and water; a process which all the carbo-hydrates undergo in the economy of the body. Fats and carbo-hydrates are interchangeable within certain limits; one part of the former can take the place of 1.75 parts of the latter, and according to the latest investigations, the starches are capable of depositing fats in the tissues as well. If fats and carbo-hydrates are supplied in deficient quantities, the nitrogenous substances are subjected to a more rapid change; and we can therefore look upon the first two ingredients of our food as the protectors against a too rapid waste of the third; but under no circumstance can fat and carbo-hydrate take the place of the nitrogenous substance entirely, for a certain quantity is constantly subjected to change and decomposition in the body, and if we compare fat and starch to the fuel necessary to maintain the machinery of the body in working order, then we must compare the nitrogenous substances to the machinery itself. Mineral substances, such as phosphate of lime and other salts, form an important item in the nutrition of the human body, especially during its period of growth; but, as a rule, they are found in quantities sufficiently large in all the foods taken, which is not shown to be the case with the fats and with the nitrogenous substances.

A food substance gains in money value as its nutritive units are increased, prices remaining the same. According to the researches of the Physiological school at Munich, the daily food must consist at a minimum of the following substances and quantities:

	Nitrogenous substances in grammes.	Fats in grammes.	Carbo-hydrates in grammes.	Proportion of nitrogenous substance to fats and carbohydrates.
1. Children, 1½ yrs. old	20-36	30-45	60-90	5.2
2. Children from 6 to 15 years old	70-80	37-50	250-400	50-80
3. Male adult at average work	118	56	500	50
4. Female adult at average work	92	44	400	50
5. Males of old age	100	68	850	47
6. Females of old age	80	50	260	44

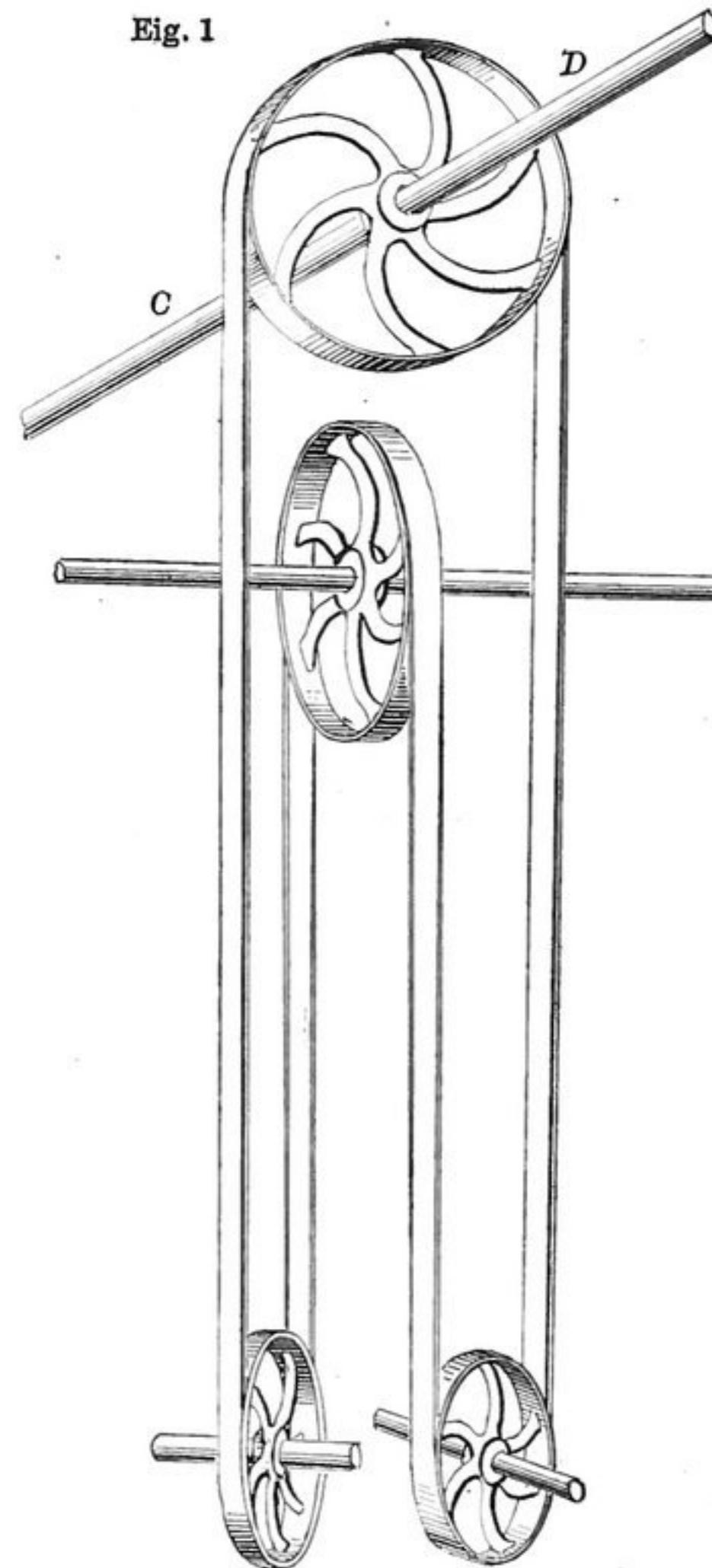
The fats are multiplied by 1.75 to reduce them to the unit of carbohydrates. From all these substances about 5 per cent. pass out of the body undigested in children, who need a larger animal diet; and from 7 to 12 per cent in adults, who need more of a vegetable diet. Of course, no rigid rules can be laid down by which everybody is to be governed; the above named figures must vary with the individuality of the person as well as with the work he is engaged to perform. The financial condition has to be considered also, as well-to-do people generally eat more nitrogenous substances; and the poorer classes more fats and carbohydrates. Besides this, the mentioned quantities are computed on the scale of a mixed diet; if the necessary nitrogenous substances are to be obtained from a purely vegetable diet, then the quantities of fats and carbohydrates must be increased considerably, as the nitrogenous ingredients of vegetable food is from 25 to 30 per cent. less digestible than that of animal food.

As a rule, one-third of the nitrogenous substances necessary per day must be given in the form of animal food, whether it consists of meat, cheese, or milk. In order to make the nutritive units of food, given in the proper proportion, fully available to the human body, such food must be properly prepared. Careful cooking, baking, addition of spices, a peculiar combination to stimulate the appetite, are necessary to make it what

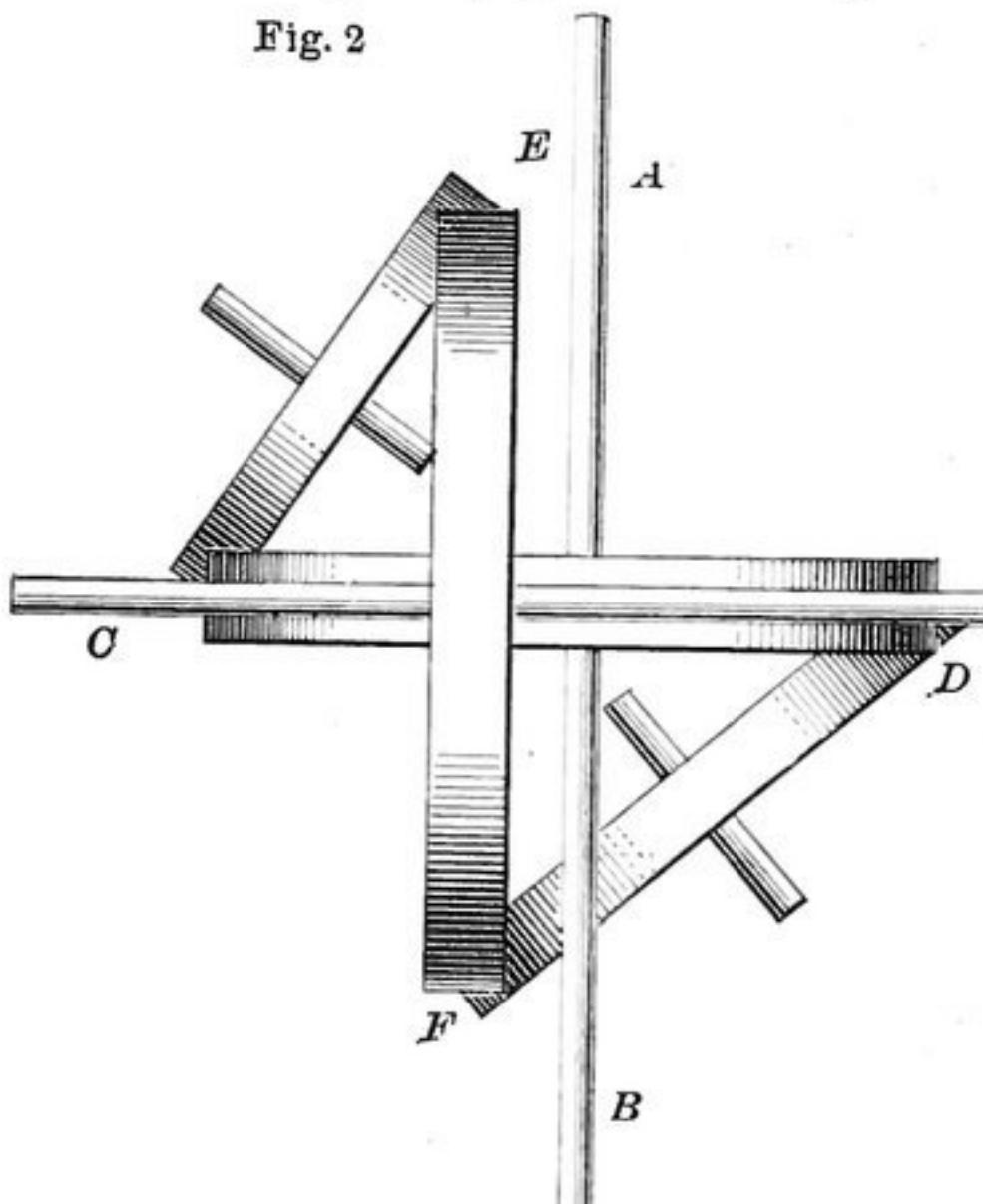
it should be, and allow the body to obtain the needed substances at a minimum expenditure of labor.

DRIVING MACHINERY.

Every machine, says the Boston Journal of Commerce, that is to be driven by motive power must be connected by some means with the main line of shafting which is to transfer a little of that useful and sustaining element that is so requisite in keeping the machinery in motion. A great amount of skill and ingenuity has been displayed in the simple matter of connection by means of belting, and every millwright and mechanic should be well versed in the principles and applications relating to this mode of transmission, for no sooner is the shafting adjusted than counter shafts must be arranged,



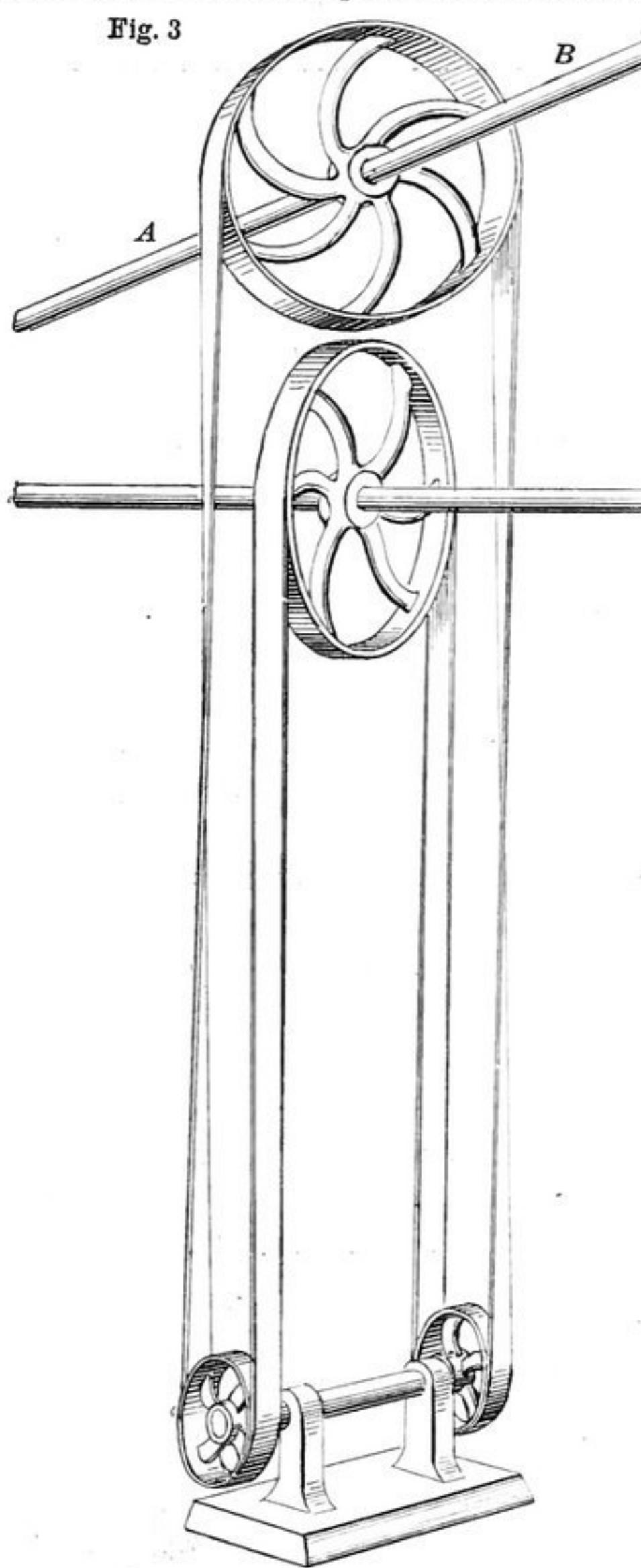
with fast and loose pulleys for the machines in and out of connection, and occasionally a cross-line shaft suspended at all sorts of angles with the main line, to suit the convenience and position of the machinery or the room in which it is to be driven. From among the different methods of belting that are to be seen in either of the fair buildings, on Huntington avenue, we have made a few outline drawings, taking as an example the



manner which the American Machine Tool Company have made the connection for driving some of the machines which they have on exhibition. In Fig. 1 may be seen a cross-line directly beneath the main line of shafting C. D. These shafts lie at right angles to each other and as near together as the pulleys will allow them, and so arranged that with the idle pulleys the four folds of the belts will hang vertical and make it very convenient for the millwright in ad-

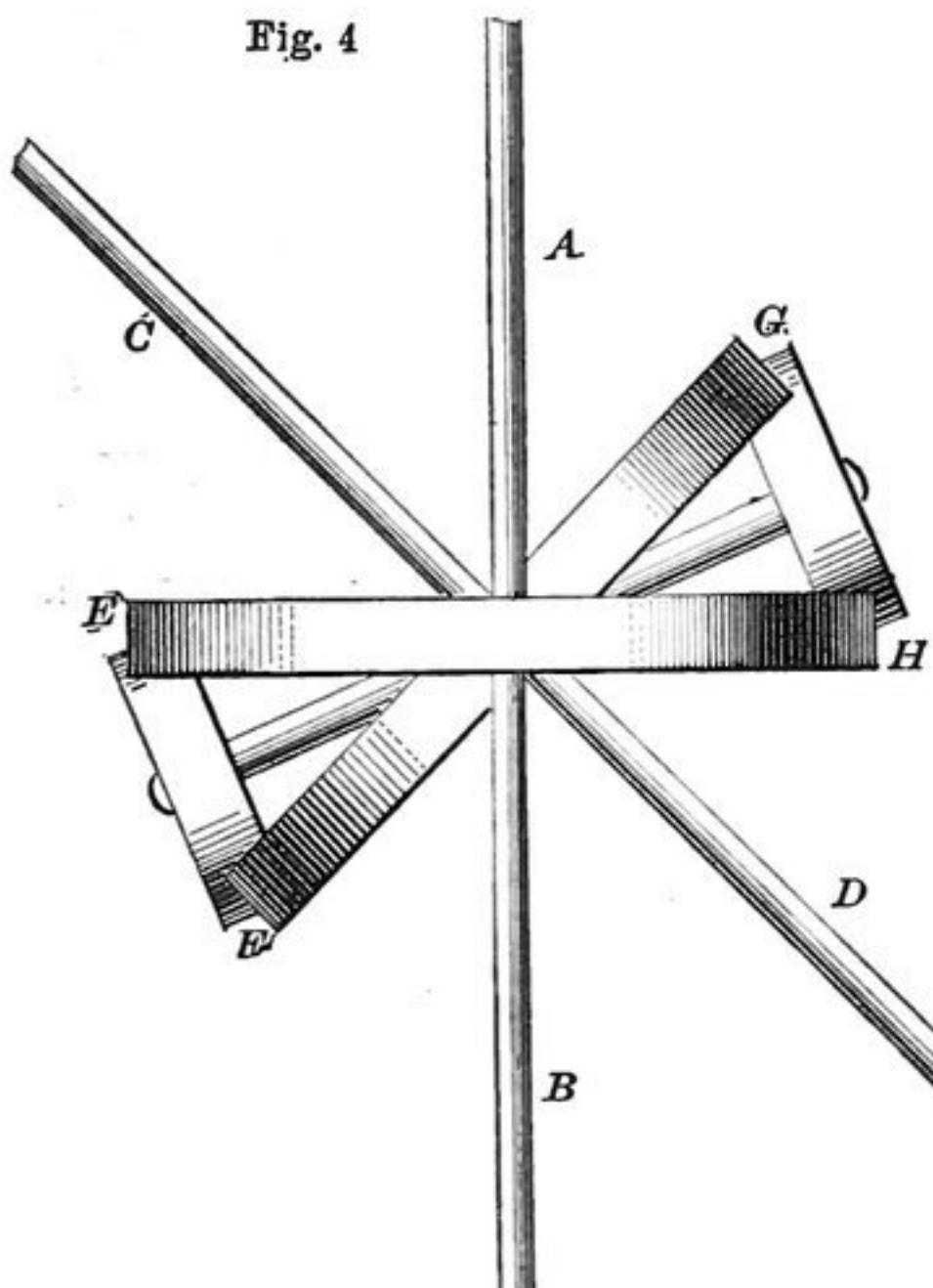
justing the idle wheels, as he has only to locate their position by means of plumb line. The plan of this arrangement is shown in Fig. 2, and shows the manner of locating the driving and driven wheels for any diameter that may be used for idle pulleys or for determining the sizes of the carrier wheels that shall reach to the quarter centers beneath

Fig. 3



each pulley. From the plan, the main line, C. D, will appear first, and brings the counter shaft beneath it, as shown at A. B, far enough to one side to be out of the way of the belt running from the driving wheel to the carrier wheels, as represented at E and F. These wheels are arranged to reach from the quarter center, at E and F, to the central line from each side of the driven wheel on the counter shaft. The further either wheel on the shafting is placed from

Fig. 4



the line of centers, or one shaft passes beneath the other, the greater the difference in the diameter of the idle wheels. One exhibitor has them arranged where a pulley as small as the one found on a saw arbor may be seen near the machine which is being driven; and we noticed in particular the advantage that has been taken in arranging belting so as to have the spans vertical from one pulley to another, for shafting that is to make an acute angle with the main line, by passing the intermediate shaft between the folds from the driving wheel, as shown in Fig. 3. This shaft is arranged at an angle of forty-five degrees, and is applicable for quite a range in the direction a shaft is to

make to reach any desired position. It will be noticed that the carrier wheels can be arranged in a parallel position, and as they both turn in the same direction can be keyed to the same shaft and turned together in one set of hangers. The plan for this arrangement is shown in Fig. 4, where the main line is shown at A B. In this figure, as well as Fig. 3, the cross-line is shown at C D, and adjusted so that the pulleys will stand one directly beneath the other at the point where the shafts intersect, and if they are of equal diameters the carrier wheels, reaching from the quarter centers E F and G H, will stand parallel with each other and allow them to be connected by a counter-shaft. This manner of belting for both methods bring the working surface of the belts in contact with each of the four pulleys without either of them running on the back, in the manner of a binder or tightening wheel, and the only improvement that can be made is in equalizing the twist for each fold of the belt, and arrange the position of the wheel for taking up less valuable space than is so often found where carrier wheels are attached to the floor of manufacturing establishments. The illustrations will enable any mechanic to follow out the principles of either method of belting and make the connection from one shaft to another under almost any circumstances to suit his own convenience, and accomplish with the plumb line what might require a working model, and a specimen of ability to work with analytical geometry, in the adoption of angular belting, and less trouble in determining what it is that is working wrong when the belt does not properly follow on the pulleys, or cannot be driven backward.

BAKING EXPERIMENTS WITH FLOURS FROM VARIOUS SOURCES.

In the English experiments with flours from American wheat 46.4 per cent. of water was used, but in our experience it has been found necessary to add on the average about 56 per cent. of water, or water and milk. The result has been that we have obtained a much larger yield of bread per hundred pounds. The effects of variation in physical conditions are illustrated by the following data from their patent flour:

Dependent on percentage of water used (other conditions being the same).

Per cent. of water.	Yield of bread.
54.5	134.5
58.4	136.9
62.1	144.9
62.1	145.5

Dependent on size of loaves.

No. of loaves.	Yield of bread.
1 loaf.	138.6
10 rolls.	129.6

Dependent on difference of temperature.

Temperature.	Yield of bread.
249	136.9
280	140.8

Dependent on time of baking.

Minutes.	Yield of bread.
50	134.6
30	140.2

In all these cases the yield is largely modified by the change in a single condition, the remaining ones being constant. It is evident, therefore, how complicated a comparative series of experiments becomes when all the above conditions exercise their modifying effects and must therefore be kept constant. There are also conditions of mixing and raising which in a like manner affect the yield. As every one knows, there are different methods of carrying out these operations, and larger or smaller amounts of yeast may be used. The method which we have finally employed is a modification of the Vienna procedure as described by Horsford. The dough is mixed in mass with press yeast and allowed to rise till the outer pellicle is just cracking. It is then re-kneaded into loaves, put in pans and set in a

warm place until the dough is again risen, when it is baked.

The baking was carried on in a large gas-stove, the oven of which by means of a thermometer could be kept at a very regular temperature. All the materials used and the products obtained were weighed to one gramme (15 grains), so that the results as far as manipulation go may be regarded as accurate. Having fixed these conditions, as they appear in the table which follows, the experiments were conducted with the different flours which have been collected.

ing paper by Prof. C. M. Woodward, director of the St. Louis manual training school, read at Philadelphia, may prove of interest to our readers. Prof. Woodward has a school of 200 boys, which has become famous, and has supplied the model for similar institutions at Baltimore, Chicago, Boston, Cleveland and other cities, and we can accept his assertions as coming from a man who knows whereof he speaks.

The plan of the school is briefly this: The course covers three years. Boys finishing the grammar schools are ready to

Name of flour.	Weight of flour.	Relation of water to flour.	Raised in h. m.	Loss rising.	Raised in Baked. pans.	Bread—		Per cent. of hot. weight	Per cent. of cold. weight	Gluten—
						min.	hot.			
Maryland Patent Flour.	2,032	56.59	2 35	12	1 07	45	2,856	2,729	33.32	9.60
	2,049	56.12	3 00	30	1 00	45	2,933	2,795	33.32	9.60
Maryland Straight	2,014	57.09	2 56	28	1 06	45	2,937	2,754	32.49	10.28
	2,081	56.62	2 45	23	1 00	50	2,866	2,746	32.49	10.28
Maryland Low Grade	2,024	56.82	2 35	18	1 55	45	2,946	2,740	30.15	11.13
	2,024	56.82	2 45	32	1 00	55	2,859	2,759	30.15	11.13
District of Columbia Patent	2,073	55.48	2 30	59	1 00	45	2,873	2,754	31.58	9.09
	2,056	55.93	3 00	36	1 00	45	2,883	2,732	31.58	9.09
District of Columbia Straight	2,045	56.23	2 30	38	1 00	45	2,867	2,757	33.40	9.76
	2,030	56.65	2 30	31	1 00	45	2,880	2,730	33.40	9.76
Straight Virginia	2,083	56.57	2 35	12	1 55	30	2,948	2,792	36.07	11.41
	2,044	56.26	2 41	19	1 02	45	2,886	2,792	36.07	11.41
	2,025	56.79	2 45	21	1 00	45	2,981	2,808	36.07	11.41
Low Grade Virginia	2,032	56.59	2 57	17	1 15	55	2,898	2,785	36.81	11.60
	2,038	56.48	2 40	28	1 00	45	2,870	2,788	36.81	11.60
Roller Patent Virginia	2,084	56.54	2 35	11	1 07	45	2,888	2,733	37.89	11.08
	2,047	56.19	2 55	34	1 00	45	2,914	2,781	37.89	11.08
Ohio Patent	2,149	53.51	8 16	32	1 15	48	2,986	2,792	29.63	10.47
	2,110	54.50	...	24	1 00	45	2,989	2,840	29.63	10.47
Indiana Patent	2,049	56.12	2 35	31	1 35	45	2,908	2,780	33.60	10.08
	2,068	55.61	2 50	35	1 00	50	2,898	2,772	33.60	10.08
Illinois Patent Flour	2,041	56.35	2 35	4	1 55	45	2,914	2,791	37.86	11.56
	2,043	56.29	2 47	19	1 00	45	2,862	2,754	37.86	11.56
Wisconsin Straight	2,035	56.51	2 50	28	1 55	45	2,833	2,730	28.39	9.56
	2,081	56.62	2 30	29	1 00	45	5,852	2,738	28.39	9.56
Roller Patent, Wisconsin	2,034	56.54	2 52	13	1 00	45	2,900	2,788	34.45	10.65
	2,040	56.37	2 30	33	1 00	45	2,862	2,745	34.45	10.65
Best Minnesota Patent Process	2,038	56.57	2 35	28	1 55	30	2,951	2,747	39.18	11.98
	2,028	56.71	2 43	18	1 57	45	2,825	2,747	39.18	11.98
	2,024	56.82	2 30	23	1 00	45	2,802	2,734	39.18	11.98
Minnesota Low Grade	2,006	57.33	2 37	18	1 00	45	2,915	2,807	34.22	14.06
	2,029	56.68	3 05	26	1 00	45	2,886	2,788	34.22	14.06
Minnesota Bakers	2,024	56.82	2 35	21	1 00	45	2,885	2,743	36.71	11.71
	2,031	56.62	2 40	32	1 00	45	2,928	2,803	36.71	11.71
Roller Patent Misouri	2,059	55.85	2 43	31	1 00	50	2,846	2,728	32.24	9.23
	2,042	56.32	2 45	39	1 00	45	2,859	2,746	32.24	9.23
New Process Oregon	2,085	55.16	2 40	41	1 00	45	2,873	2,689	20.84	6.75
	2,087	55.10	2 30	24	1 05	45	2,888	2,753	20.84	6.75

The same quantities of water, milk, salt and yeast were added to each sample; to wit, water, 650; milk, 500; salt, 15; yeast, 10 grammes. The results are variable within limits which are so narrow as to make it impossible to say that one flour will make much more bread than another, and it will be observed that the lowest grade gives as large a yield, or even larger, than the best patent. If, however, the moisture in the flour had been less uniform our results would probably show a larger yield of bread for the drier flours. The conclusion must be then that the yield is dependent on physical conditions of bread-making, and not to a large extent upon the chemical composition of the wheat. In all our experiments we get a much larger percentage of bread than the McDougalls, but it is due to the possibility of the use of larger amounts of water in the dough. In other respects their conclusions are confirmed that water is the chief conditioning agent, and that the per cent. of gluten has but little effect upon the yield.

That it has some, however, appears from the fact that the largest yield was obtained with a Minnesota low-grade flour, having the highest gluten of any experimented with, and the lowest yield was from the Oregon flour, having the smallest amount. The bread from the low-grade flour mentioned, although the heaviest yield, was dark and of the worst quality; that from the Oregon flour was white and fair. These flours are very peculiar, and in another place a few remarks are made upon their composition. Aside from quantity, the quality of the bread made from Minnesota patent flours is certainly as near perfect as could be wished. That from other patent flours suffers slightly in comparison, while, of course, the bread from straight flours, bakers', and low-grade, cannot compare with that from patents.

MANUAL TRAINING SCHOOLS.

So much has of late been written upon necessity of manual training, that the follow-

enter. Five days per week and forty weeks per year, the usual term. The hours are from 9 A. M. till 3.20 P. M. The daily programme for every boy includes three recitations on language, mathematics and science, (the lessons must be studied at home), one hour of drawing, mechanical and free-hand, and two hours of systematic shop work with the best of tools and teachers. Professor Woodward exhibited a printed daily programme, showing just how the exercises are interchanged. There are ten teachers, one to about twenty boys.

In the past, education has touched practical life at too few points. Nearly all the machinery of education has been in the hands of persons who have had very little to do with the acquisition of wealth, but who are pretty alive to its advantages. We have taught how to live, not how to make a living; how to use wealth, not how to get it. Manual education is an attempt to stem the tide of popular education and to direct it in part into new channels. It has been running in a bed too narrow, with banks too high.

To the question: What do we aim to make of our boys? he answered: "We aim to make men of them. Whether they will become mechanics, or architects, or lawyers, or doctors, or scientists, or journalists, or artists, or teachers, I cannot tell. I doubt not they will be found in all honorable professions and occupations. We strive to open every door; to pull down every barrier; to shield them from the baneful effects of a silly prejudice and a false gentility; to teach that in every occupation there is a demand for brains and room for study and culture and intellectual life. We know that in the past it has been the fashion to assume that men who have cultivated their brains have had little occasion to know how to use their hands, and that to be a mechanic and to make one's living by manual labor is *prima facie* evidence of a lack of culture, or a lack of

brains. We swing to neither extreme; we combine mental with manual training. We would at one and the same time lay the foundation for good scholarship and for good artisanship. Our motto is: 'The cultured mind, the skillful hand.'"

Every child is entitled to be taught three methods of expression: 1. By the written or printed or spoken word. 2. By drawing with pen, pencil or brush. 3. In the concrete, through the instrumentality of tools and materials. After explaining how shop instruction is given, Professor Woodward said: "All the shop work is disciplinary. The tools used are the parent ones, and the processes are as typical as possible. Special trades are not taught, nor are articles made for sale. The scope of a single trade is too narrow for educational purposes. Manual education should be as broad as intellectual. A shop which manufactures for the market is necessarily confined to salable work, and a systematic and progressive series of exercises is practically impossible. If the object of a shop is education, a student should discontinue any task or process the moment he has learned to do it well. In a factory a boy is kept on what he can do best; intellectual life and growth are not aimed at; everything is for the benefit of the business. In a manual training school everything is for the benefit of the boy; he is the most important thing in the shop; he is the only article to be put upon the market."

As to the trades for which the drawing and shop exercises are preparatory, the speaker said that the wood-work, forging and machine shop work was required of all students alike, and was equally preparatory to scores of trades. Every occupation involving the use of hard and soft woods; of framing, dovetailing, gluing, pattern-making; of forging iron, steel and brass; of tempering, brazing and soldering; of chipping, filing, drilling, tapping, screw-cutting, polishing and fitting—may follow with great advantage, provided the boy develops the requisite taste and ability. Not every boy is fit to be a merchant.

The exercises should always be short, not longer than the duration of a lively interest and a close attention. When attention flags, progress stops. For boys of 16, two hours at a time is long enough for healthy intellectual growth. The boys greatly enjoy their work, and the variety afforded is very stimulating. The graduates have strong appetites for study and like to go into shops. Employers testify that they find the boys far more skillful than was expected and very apt and intelligent. Of the 200 boys in the school about one-third are on free or partially free scholarships; the others pay an average annual tuition fee of \$80.

The outfit of a manual training school is more costly than of a common high school. Professor Woodward closed as follows: "In conclusion, let me predict that some form of manual training is destined to be fully incorporated into American public education. Too long have we tolerated a one-sided system; too long have books and literary culture monopolized the machinery of the schools, and shut out other kinds of culture as useful, as noble, as humane, as intellectual as that of letters. We are learning that one must be useful before he can be ornamental; that the mechanical must precede the fine arts; that in this age, which I have ventured to call the dynamic age, there are other forces to be studied and utilized than those of authority and tradition; that there are many ways of studying human progress; a great variety of opportunities for making much of ourselves, and the world better for our having lived in it."

THE first copper mine in the United States is said to have been worked in 1709 in Connecticut.

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Advertisements of Mills for Sale or Rent, Partners Wanted, Machines for Sale or Exchange, etc., etc., cost 1½ cents per word for one insertion, or 4 cents per word for four insertions. No order taken for less than 50 cents for one insertion, or \$1 for four insertions. Cash must accompany the order. When replies are ordered to pay postage.

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A mill in



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THOS. MCFAUL, - - General Agent.

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Card of Rates sent promptly on application. Orders for new advertisements should reach this office on Tuesday morning, to insure insertion in the week's issue. Changes for current advertisements should be sent so as to reach this office Saturdays.

EDITOR'S ANNOUNCEMENT.

Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

Correspondents must give their full name and address, not necessarily for publication, but as a guarantee of good faith.

This paper has no connection with any manufacturing or mill furnishing business. Its editorial opinions cannot and will not be influenced by a bestowal or refusal of patronage. It has nothing for sale, but its space to advertisers and itself to subscribers.

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Readers of "The Milling World" will confer a favor upon the publishers, and derive material benefit themselves, by mentioning this paper when opening correspondence with advertisers. Drop us a postal card when you have written to an advertiser, give us his name, and then we will put you in the way of getting the benefit. Don't forget this.

THE MILL FURNISHING TRADE.

IT is estimated that in the United States there are about thirty thousand establishments in which wheat is converted into flour, or corn into meal. We say estimated, but have good reason to know that the estimate is much too high. It is not a difficult matter to count up three hundred persons or firms who are engaged directly or indirectly in the mill-furnishing trade. If now we admit that there are thirty thousand mills, and three hundred mill furnishers, each of these mill furnishers could reasonably anticipate, all things being equal, the cus-

tom or trade of one hundred millers. All things, however, are not equal. The larger mill-furnishing establishments, by reason of better facilities for producing can underbid the smaller establishments, and because of more ample capital can present inducements for the bestowal of patronage which the average miller finds it very difficult to resist, hence the larger share of patronage gravitates to the larger mill-furnishing establishments. For a number of years past the business of mill-furnishing has experienced a degree of prosperity perhaps unparalleled by that of any other manufacturing interest. It could hardly have been anticipated that this prosperity would always wait upon it. Extraordinary circumstances combined to bring about this prosperity, and the vanishing of these conditions must necessarily react upon the prosperity of the business. For more than a year past the trade has been feeling more or less depressed. A continuance of this depression will force some houses to the wall and others to seek outside lines of industry. Gradually, but, nevertheless surely, the business of mill-furnishing is passing into the hands of a few large and wealthy firms or corporations, and the profits accruing from its prosecution are being curtailed. A glance through the advertising columns of the milling journals will evidence the truth of our first proposition, and a request for prices from any mill-furnishing house will testify to the truth of our second assertion. Prices for all mill-machinery and supplies are very low, and will so continue until competition is modified. Just now it is of the keenest possible character. So keen is it that shrewd millers have actually procured portions of their equipment below cost of production. A good thing for the miller but decidedly otherwise for the mill-furnisher.

Much of this unprofitable competition has been unnecessarily provoked and fostered. At the first it seemed to be assumed that cutting prices was the surest way to retain old customers and secure new ones; it was, apparently hoped that lower prices would stimulate trade, and encourage millers to put in machinery, or undertake improvements in their mills. Such however was not the result, on the contrary it seemed to have an effect just contrary to what was anticipated and desired; millers, like wheat buyers, got the idea that values would go lower still, and therefore they largely refrained from purchasing. We would not be understood as saying that the mill-furnishing trade was dead or dying, but that it is not so active as those engaged in it would like to see it. There is, and can by no means of its revival, or that it will increase in extent and importance. We believe this will be the case, but it will be conducted differently from what it has been, in the past. Tom, Dick and Harry cannot go into it, and rely upon the millers' ignorance for patronage and profit. Skill, experience and ample capital will be necessary. The middleman will, ere long, occupy a less prominent position than he has in the past. That is he will not be deemed so essentially necessary to the happiness of the miller and the mill-furnisher. The millennium is not about to dawn but both miller and mill-furnisher will see that, as a matter of economy, it will be best to have direct dealings one with the other.

A BILL is pending in Congress to establish the metric system and measures in the different departments of the government which reads as follows: "That from and after the fourth day of March, Anno Domini, eighteen hundred and eighty-nine, the metric system of weights and measures, as recognized and expressed in section thirty-five hundred and seventy of the revised statutes, shall be exclusively employed by the several departments and branches of the Federal

Government in the affairs of the United States: Provided, that in all other transactions than those in which the United States is a party, it shall be lawful to employ the weights and measures now in use. Sec. 2. That a knowledge of the said metric weights and measures shall be taught in all the schools and colleges now under the control of the Federal Government or hereafter aided by it, or such knowledge shall be required for admission to the said schools and colleges. Sec. 3. That all laws inconsistent herewith are hereby repealed." Now while we are heartily in favor of the metric system because it unifies, and consequently simplifies, all values and measures of commerce, we do not believe in the government adopting one system when the country at large is working another system. We do not believe in the enactment of laws unless upheld and demanded by at least a strong intelligent minority, and in view of the present immense internal commerce of the United States as compared with the exports, there does not appear any pressing necessity to change the present system of weights and measures. Moreover, we do not believe that the government should take the initiative in this matter, we would consider such an action entirely premature at the present time, when but few establishments throughout the land have adopted metrical measurements. We would consider it a far more healthy move if provisions were made to have the benefits of the metric system taught intelligently in our schools first, and then allow the feeling for the necessity of its adoption to be of a natural and gradual growth. Or if, on the other hand, the export commerce of the United States should increase very largely, and England should enforce the metric system, as recently reported, leaving the United States practically isolated in its weights and measures, while all other countries have adopted a uniform system, then the necessity for a reform on this side of the Atlantic may appear sooner and the necessary laws will not be wanting. Until then we consider any forcing by legislation more injurious than beneficial to the future success of the system in the United States.

CANAL building in its present proportions is generally looked upon as a thing of modern times and a triumph of engineering made possible by the most recent applications of science. But looking at the greatest schemes in that line, the Suez canal and the Panama canal, we find that the prototype of the former already existed B. C. 1344 in a canal cut between the Nile and the Red Sea, which was used to such an extent that it needed and underwent a material enlargement 800 years later. The route of the Panama canal has been found carefully delineated on an old globe made by Jesuits in the middle of the sixteenth century, and even the canal cutting now in progress through the isthmus of Corinth was extensively worked at during the time of Nero. When we consider the many advantages possessed by modern engineers as compared with their olden time brethren, we cannot help but admire the boldness of their conception in overcoming obstacles which even at present appear insurmountable.

AN international milling exhibition is to be held at Paris next year from May 1 to October 31. It seems that the French millers are awakening to the necessity of a reform in milling in order to keep up with the times, and they have adopted this exceedingly sensible way to obtain a thorough demonstration of the different milling systems by sending out invitations to an exhibition. The French Minister of Agriculture, M. Meline, appears to understand the condition of the milling industry in this coun-

try, and has taken an active interest in the matter; he has not only commissioned M. Lockert, the editor of the "Journal de la Meunerie," to make all arrangements necessary, but has also placed the necessary buildings at the disposal of the forthcoming exhibition. No better place than Paris can be found for the purpose in France, and American millwrights who desire to avail themselves of this opportunity, can obtain the necessary information by addressing Mons. L. Lockert, 24 Rue Norvins, Paris.

SOME one will, one of these days, make a very nice little fortune by getting up a simple, cheap and efficient cockle separator. Attempts, almost innumerable, in this direction have been made, but thus far without entire, or even fairly satisfactory, success. The Kurth machine is the only one on the market, and of its value or efficiency nothing need be said, but there are thousands of millers who think they cannot afford to purchase it, and, consequently, a new machine to successfully compete with it, must be fully as efficient and very much cheaper, and to avoid infringement of patents must be most radically different in principle of operation. The problem is not impossible of solution but it will take a genius to solve it.

PENNSYLVANIA should rouse itself to the emergency which threatens it. Some southern states have had the temerity to lay iron down within its borders at lower prices than producers in the Keystone state can afford to. In protection to count for naught? The "Solid South" is becoming aggressive, and, as if to add insult to injury, it is making a better iron than is produced in Pennsylvania. Surely some measures should be taken to check the mad ambition of Dixie.

AGRICULTURAL Associations in France are very modest, if they are anything, and consider themselves the pivot upon which the well-being of the country is centered. In consequence of this assumption they have asked their government to fix the duties on imported grain at 5 francs and on flour at 9 francs per 100 pounds. That certainly is a tariff revision with a vengeance.

THE opening of the Mexican Central Railroad is said to be a great boon to the country which it traverses. Many resources of the land which have hitherto remained undeveloped for want of transportation facilities, are now utilized and the people are stimulated to enterprise and activity formerly unknown in that region of the world.

THE German papers have of late been discussing the grain and flour tariff as extensively as possible, and now we are told that all the expended brilliancy has been wasted, useless, for it has been declared officially that the Government has never contemplated any change whatever in the existing tariffs.

PRAGUE, Bohemia, is contemplating the erection of a flour and grain exchange. Perhaps the Bohemian millers and flour dealers will feel more competent to do battle with that grim specter "competition" from Hungary and America, by a pooling of the interests into one central exchange.

THE treaty recently signed between the United States and the Islands of Cuba and Porto Rico allows the free entrance into these Islands of all kinds of grain and flours with the exception of wheat flour which has to pay a duty.

YOU have had your Thanksgiving turkey, of course, and are anticipating a Christmas goose, no doubt, but remember the devil's to pay in this office, and your subscription will help out.

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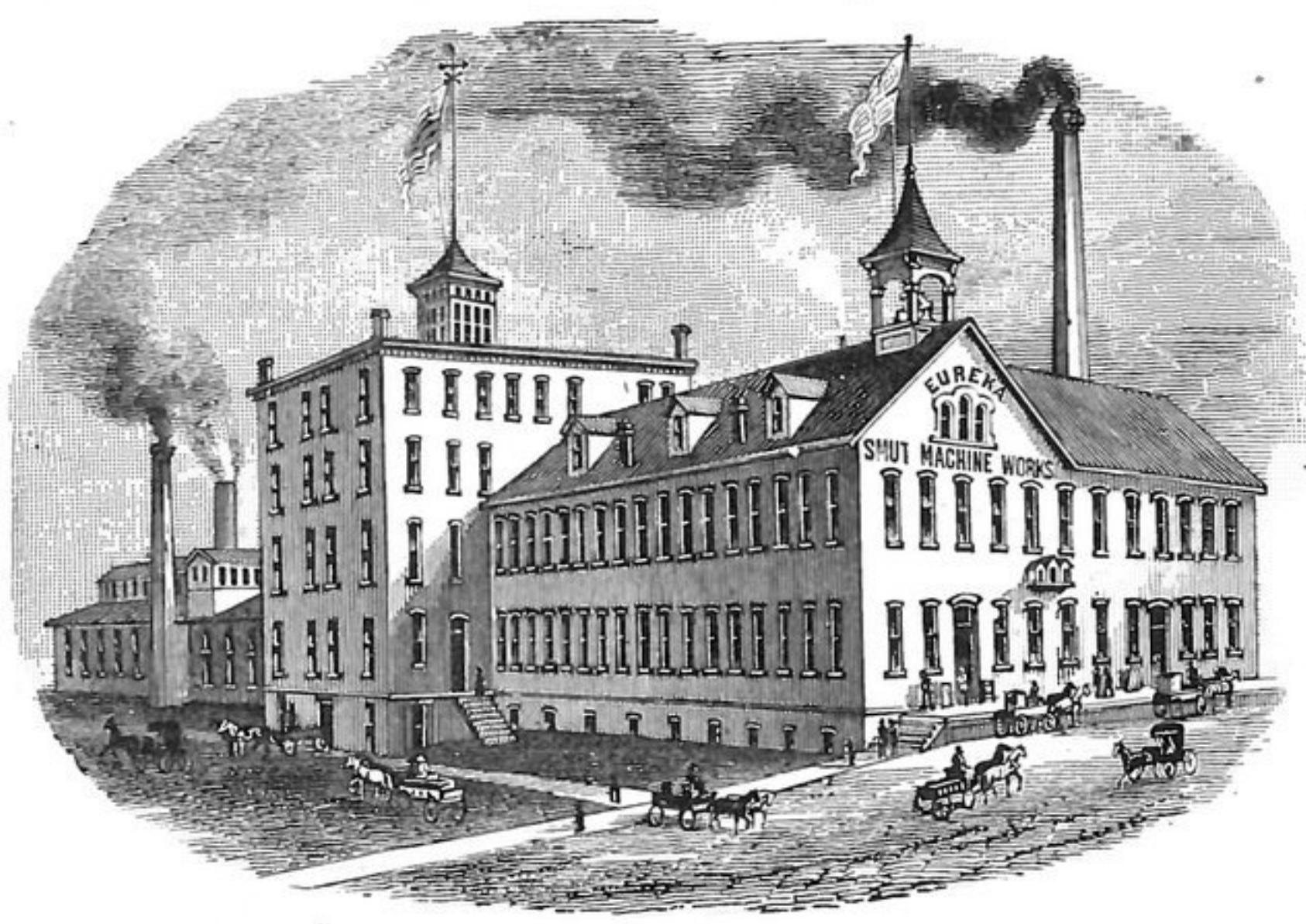
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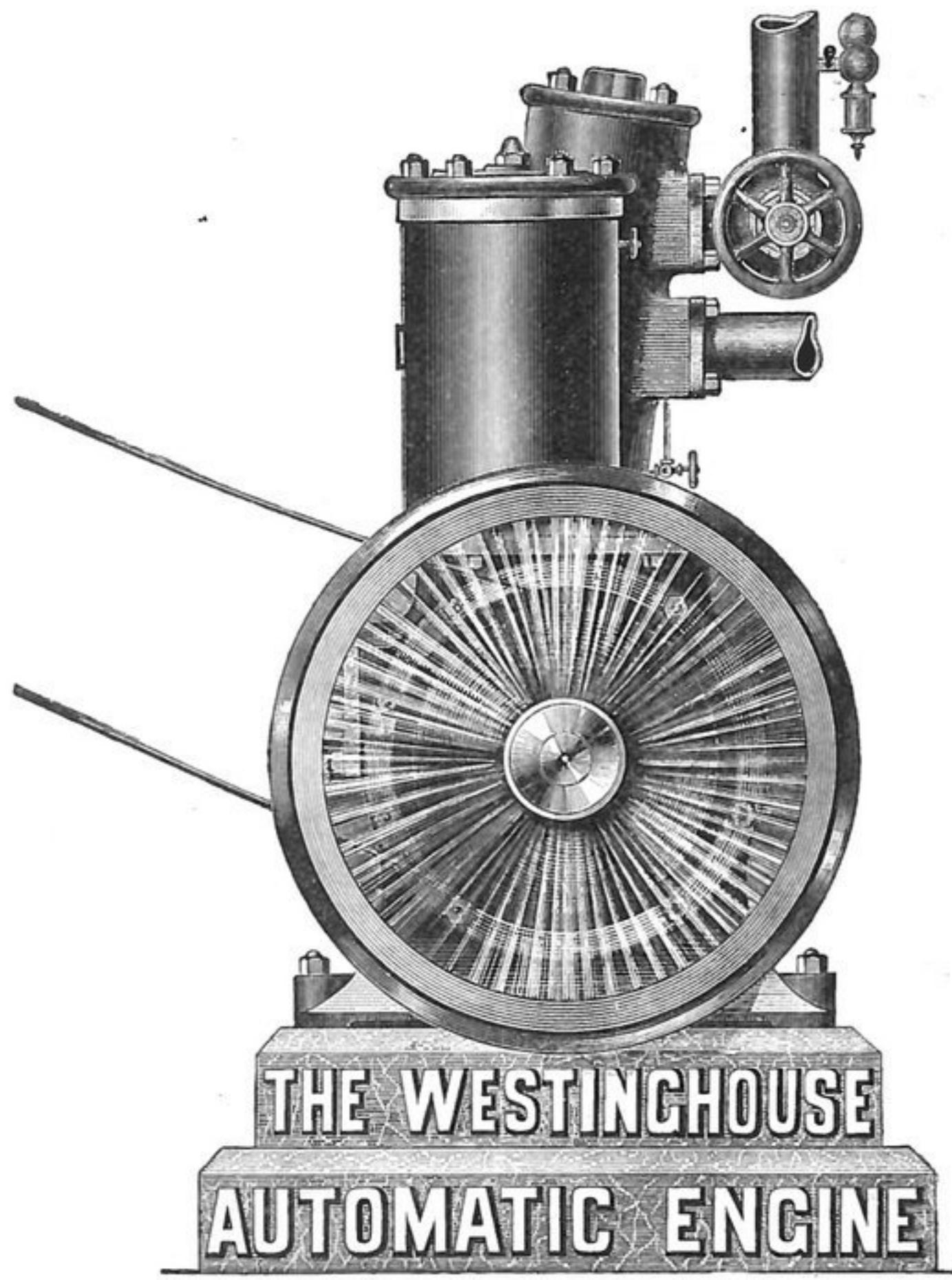
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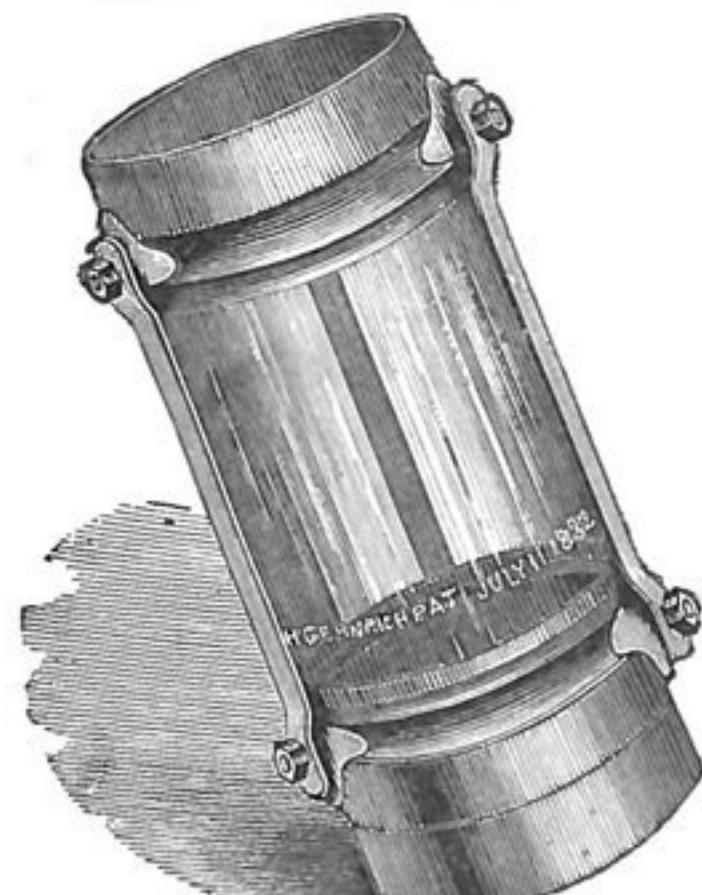
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GEHNRICH'S PATENT GLASS TUBE JOINTS
AN IMPORTANT INVENTION FOR MILLERS.



This invention consists of a Glass Tube Joint, which can be made to correspond in size to and be inserted in any tin spout used to convey grain, meal, etc., in the operation of Grinding Flour and other substances. A section of the spout is thereby *Rendered Transparent, enabling the miller, or any one passing by, to see at a glance whether the contents of the spouts are properly running.* By the use of this appliance the necessity of frequently opening spouts is avoided, and the consequent saving of time and flour is very important in an economical point of view. These Glass Tube Joints have given the most complete satisfaction, and are esteemed as an indispensable requisite wherever they have been applied. Full information furnished on application to the inventor.

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ANCHOR BRAND BOLTING CLOTH.

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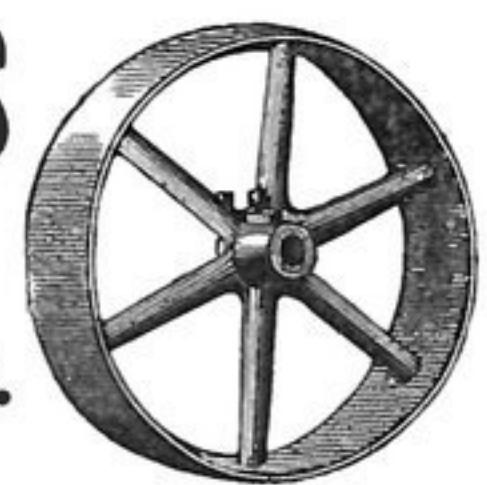
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It Makes a Uniform Product and Reduces the Low Grade.

This important element of our Rolls and Purifiers is being infringed by others. We own and control exclusively under a large number of patents, this VIBRATORY FEED, and it has become necessary for us to notify the millers that we are about to enter suit against all parties infringing our rights. Write us for low prices on Rolls, Purifiers, Centrifugal Reels, &c.

ADDRESS,

THE CASE MFG. CO.,
COLUMBUS, OHIO.

THE "SALEM" ELEVATOR BUCKET.

SHOVEL EDGE

Seamless Rounded Corners

CURVED HEEL.



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STRONG & DURABLE
EMPTIES CLEAN.

W. J. CLARK & CO., MANUFACTURERS, SALEM, OHIO.
New York Office and Salesroom, No. 9 Cliff Street.

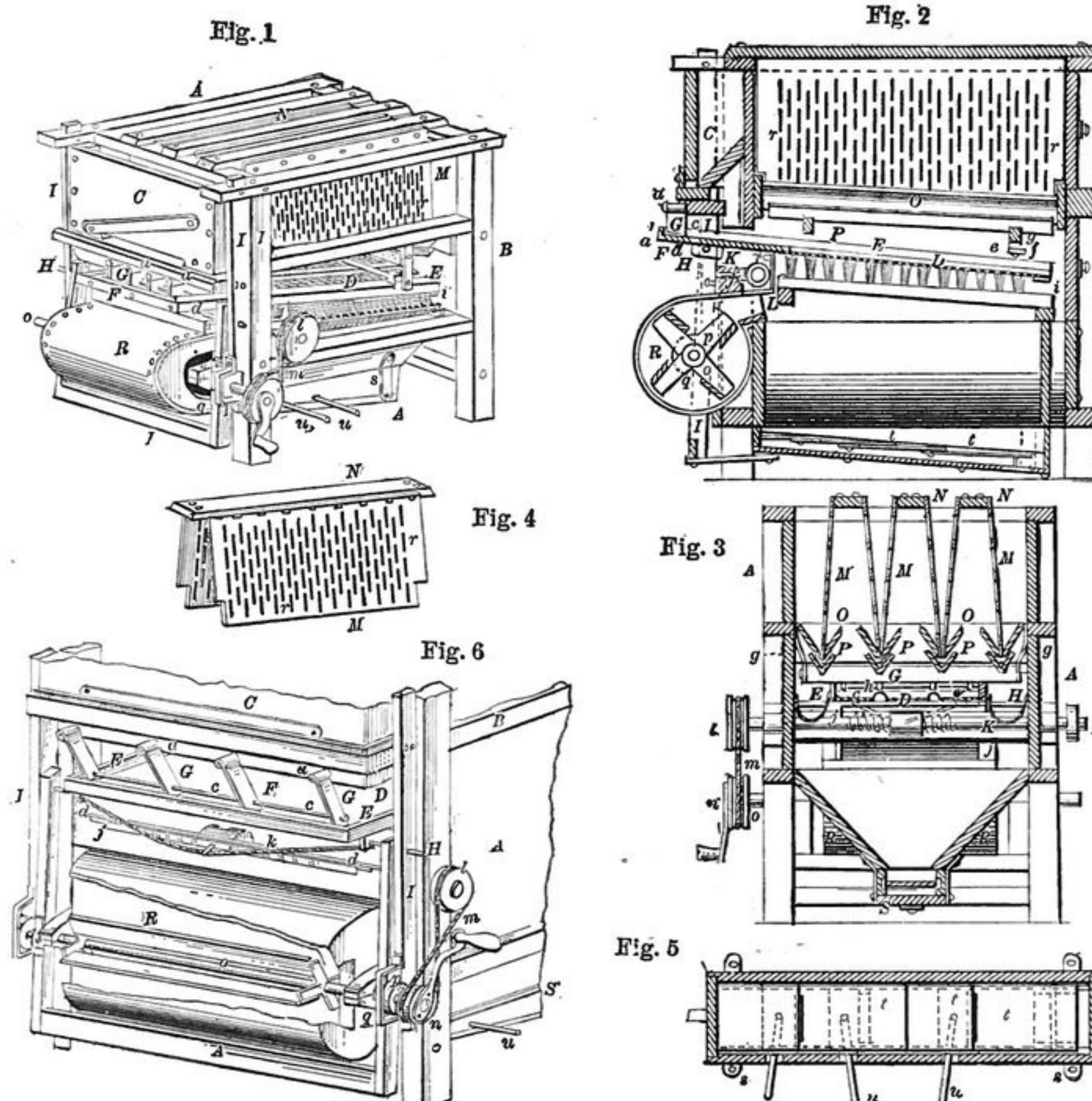


MIDDLES PURIFIER.

Letters Patent No. 308,099, dated Nov. 18, 1884, to Charles G. Rollins, of Minneapolis, Minn. This invention relates to machines for purifying flour and middlings. In the drawings, Figure 1 represents a perspective view with a part of the machine removed to show the details. Fig. 2 represents a longitudinal vertical section on the line 2 2 of Fig. 1. Fig. 3 represents a transverse vertical section on the line 3 3 of Fig. 1. Fig. 4 represents a perspective view of the dust catching device shown herein, but which it is designed to embody in a subsequent application for letters patent. Fig. 5 represents a sectional plan view of the shaking shoe for separating and carrying the middlings. Fig. 6 represents a sectional perspective view of a portion of the front end of the machine. In the drawings, A represents the sides, and B the ends, of a bolting chest of substantially the ordinary construction employed in this class of machinery. C represents a hopper, through which the flour or middlings is introduced to the horizontally-reciprocating bolt or riddle D. The frame E of this riddle or sieve D has at one end an outwardly-extending portion, which forms a head board, F, upon which the flour or middlings from the hopper falls. G represent slides or distributors suitably connected together and having at their pivotal ends bearings α in the frame under the feed-board α' , in order that as the riddle or bolt reciprocates, its side sills will, during the lateral movement of said bolt, operate to pull the lower end of the outer slide in the same direction, and as these slides are connected together at the lower end by a wire or rod, c , such outer slide will in its movement in either lateral direction pull the remaining slides after it, retaining the same relative position to the face of the head-board, and thus distribute the middlings evenly across the head-board before reaching the head of the cloth. The frame E of the riddle or bolt D extends from the head to the tail of the machine, and is supported at its head in an inclined position upon a rod, H, which passes through blocks d on the under side of said frame, and has bearings in the part I' of an oscillating frame I I', to be presently described. At its lower or tail end said frame has notched or recessed cleats e , within which rests a rod f , which is supported in spring hangers g , attached at their upper ends to the framing sills, and serves to support, with capability of free movement, the tail end of the riddle frame. The bolting cloth may be of one or any number of degrees of fineness, as desired, and is attached to the bars h . The longitudinal bars h have their under faces made concave in order that when the parts are at rest from lateral motion, as hereinafter described, the bristles of the brushes employed for brushing the cloth may be allowed to retain their perpendicularity and to avoid their being bent or pressed down and broken or forced permanently out of operative shape. The device for brushing the cloth of the sieve consists of a series of brushes, J, arranged longitudinally of the riddle and rigidly secured in position beneath the same with the tops of the bristles in contact with the under face of the bolting cloth. K represents a reversing screw shaft, which has engagement with a traveler, L, working in a slotted bar or beam, j. This traveler is connected by means of a cord or chain, k , with the blocks d on the under side of the riddle frame E. I represents a pulley mounted upon one end of the screw shaft K, which connects by means of a belt

or band, m , with another pulley, n , on the fan and driving shaft o . Upon motion being imparted to the shaft o , the screw shaft K will through the medium of the pulleys l n and belt m , be turned, so as to cause the traveler L to reciprocate in the slotted beam j, and as said traveler reciprocates it will, through the medium of the cord k , reciprocate in a transverse direction the riddle or bolt D, and thus cause it to travel over

g, on the lower end of the outer member, I, of the oscillating frame. As the shaft o revolves, the eccentrics p p are revolved within their respective straps q q , and the outer member, I, of the frame is thereby oscillated. As the outer member of this frame oscillates it will reciprocate the feed board and permit the downward flow to the head board of the middlings or flour, and through connecting rod H impart a longitudinal oscillatory

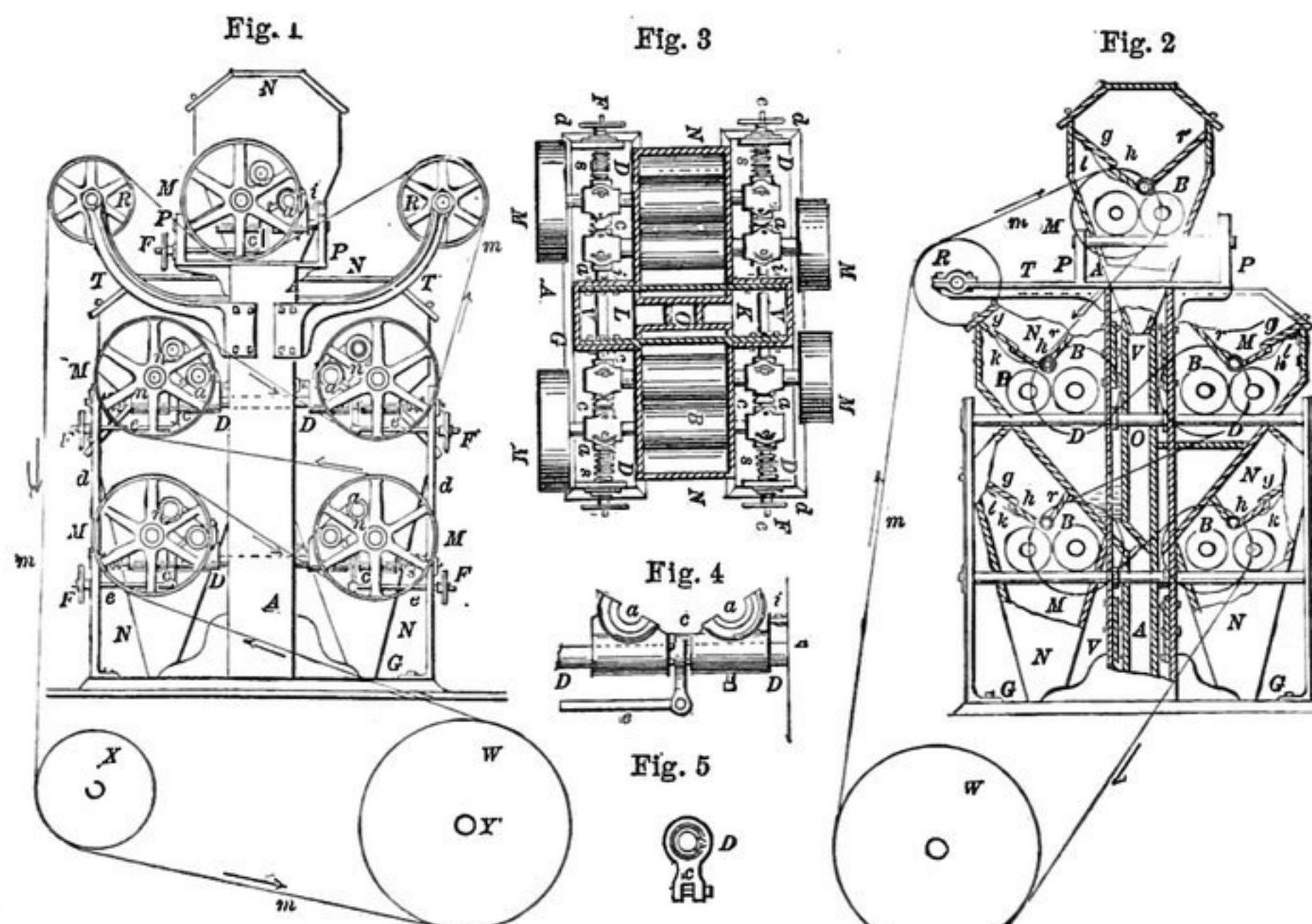


PATENT NO. 308,099. MIDDLES PURIFIER.

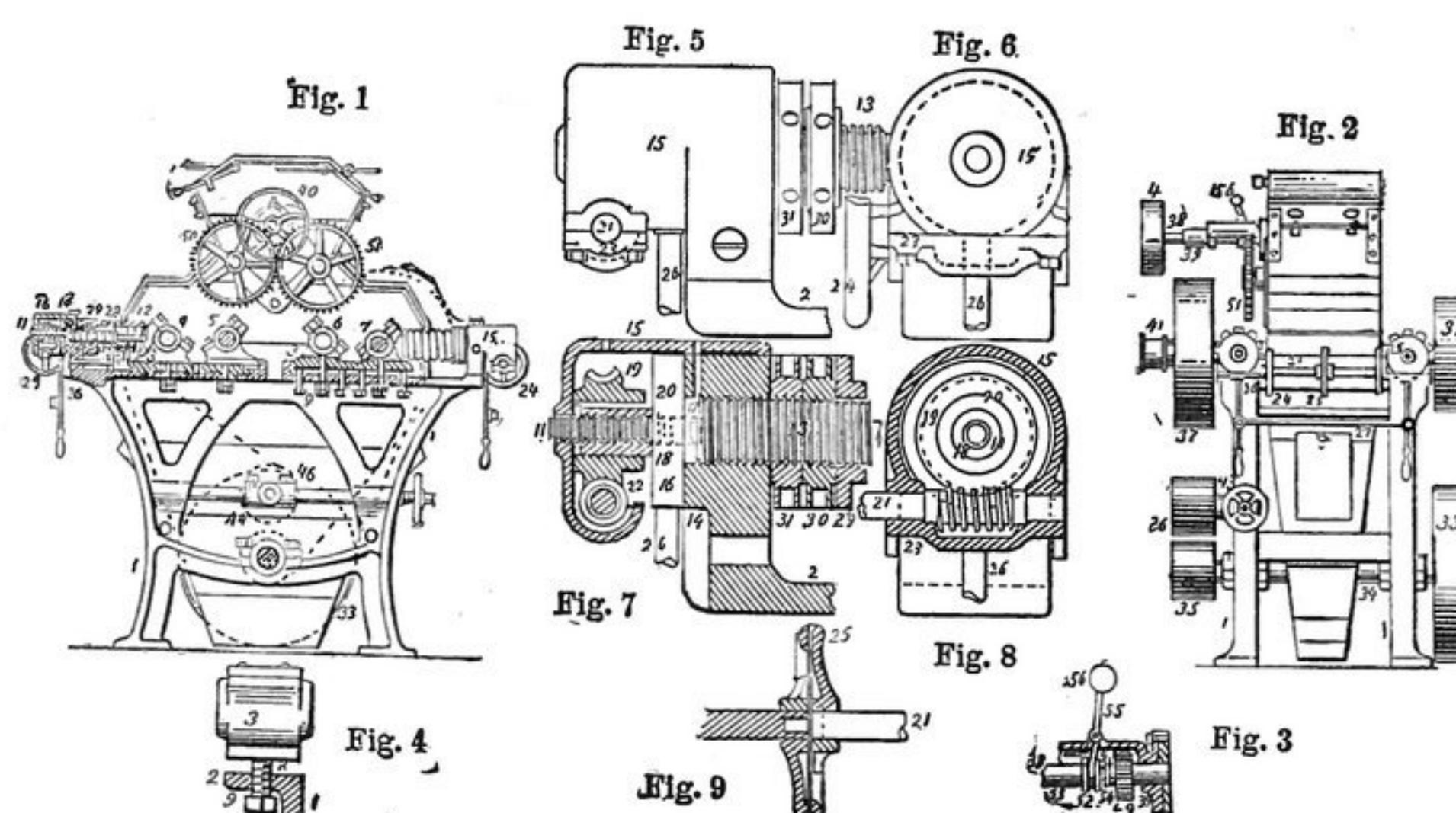
projects inward and beneath the riddle and the brushing device, and the chest is so closed at these parts that the air from the fan must necessarily pass up through the bolting cloth to and carry with it the dust up between the inner faces of the perforated metal plates M; then as the perforations r in the plates M are too small to allow the dust to pass through, said dust will, as the air passes through said perforations, be strained out, and either drop down directly to the dust-receiving spouts or slide down the plates M to said spouts, and be by them conveyed to a suitable discharge-spout at the end of the machine. S represents a shoe or conveyer, which is suspended from the outer sides of the stationary gathering-boards B with capability of reciprocating by straps or hangers s . At one end this shoe is connected by means of a strip, A', with the bottom end of the inner oscillating frame, I, which during its movement imparts to the shoe a longitudinal reciprocation, which motion is at each throw simultaneous with but in an opposite direction to the longitudinal motion of the D above. Thus the throw of one is counterbalanced by the throw of the other in the opposite direction. Thus the vibration imparted to a machine where the throw of the parts is entirely in one direction at each movement, which is always the case where but one eccentric or one set of eccentrics is used, is avoided. This shoe S is divided transversely into two or more compartments by means of horizontally-slotted sides t , having handles or arms u , which project outward through slots in one side of the shoe.

ROLLER-MILL.

Letters patent No. 308,131, dated Nov. 18, 1884, to Oscar A. Byrns, of Appleton, Wisconsin. Figure 1 is an elevation of the side of the machine upon which the outer rolls are driven. Fig. 2 is an elevation of the reverse side of the same with the journal boxes removed, and with portions of the standard and the casing cut away. Fig. 3 is a horizontal section on the line x x, Fig. 2. Fig. 4 is an enlarged view of a side of one of the adjusting-levers in connection with a pair of boxes; and Fig. 5 is a front view of said adjusting-lever. The inventor makes the following claims 1. In a roller-mill, the combination of an upright hollow standard provided with external supports, upon which the rolls B B are mounted, and with internal conduits, K L O, which conduct away the product of said rolls, rolls B B, and casing N, substantially as and for the purposes set forth. 2. In a roller-mill, the combination of a central hollow standard composed of the posts A A, connected and braced by cross plates V V, with rolls B B, mounted thereon in pairs, substantially as and for the purposes set forth. 3. The combination, in a roller-mill, of a central hollow supporting-standard with transverse shafts D D, passing through and secured in said central standard, rolls B B mounted in pairs upon said shafts D, and mechanism for driving said rolls, substantially as and for the purposes set forth. 4. The combination, in a roller-mill of a central upright supporting-standard, A A, detachable cross-shafts D D, passing through and secured in said central supporting-standard, boxes α α' , provided with transverse sleeves fitting and adjustable upon the shafts D D, rolls B B, mounted in said boxes upon the protuding ends of shaft D, and mechanism for adjusting the distance between each pair of rolls, substantially as and for the purposes set forth. 5. The combination, in a roller-mill, of a hollow central supporting-standard, the rolls B B, mounted in pairs in suitable supports on the sides of said hollow standard, the casing N N, divided into compartments for each pair of rolls, pipes K, L, and O, inclosed within said hollow standard, for



PATENT NO. 308,131. ROLLER MILL.



PATENT NO. 308,254. ROLLER GRINDING MILL.

the stationary brushes and secure the brushing of the cloth. The oscillating frame is composed of two parts, I I', one of which, I', is journaled upon the fan shaft o , and is at its upper end connected by means of rod H with the riddle frame. The other member, I, of the oscillating frame I I', is connected with each end of the feed board. At each outer end of the fan or driving shaft o is an eccentric, β , each of which on the revolution of the shaft o revolves within a strap

movement to the inner member of the frame I I', and also to reciprocate the riddle or sieve D. It will thus be seen that the sieve or riddle has imparted to it during the movement of the fan or driving shaft o simultaneously both a longitudinal and a transverse reciprocating movement. R represents a fan, by means of which air is supplied to the interior of the bolt chest for the purpose of separating the dust from the middlings. The mouth of the fan case

conducting away the product of each of the upper sets of rolls, feeding devices, and mechanism for driving and adjusting the rolls, substantially as and for the purposes set forth. 6. In a roller-mill, the combination of a central supporting-standard, transverse rods or shafts D D, rolls B B, mounted in pairs upon the protruding ends of said shafts, D, boxes a a', provided with sleeves for the reception of said supporting-shafts D D, levers c c, mounted upon said shafts D between each pair of boxes a a', eyebolts, e e pivoted to said levers c, and hand-screws F F, whereby said rolls are adjusted in position, substantially as and for the purposes set forth. 7. The combination, in a roller-mill, of the central standard or support, transverse shafts D D, rolls B B, mounted in pairs upon the protruding ends of said shafts D, boxes a a', provided with transverse sleeves to receive shafts D, bars d d, to which are secured the ends of shafts D, springs s s, placed around shafts D between the outer boxes and the upright bars d d, and the mechanism for adjusting the space between each pair of rolls, substantially as and for the purposes set forth. 8. In a roller-mill, the combination of the central hollow supporting-standard, A, rolls B B, mounted in pairs on each side of said standard, feed-rolls w w, the casing M, hoppers formed by the walls of said casing and the inclined partitions g, h and r, the section h hinged to section g and supported by spring k, screw, and adjusting-nut l, substantially as and for the purposes set forth. 9. The combination, in a roller-mill, of the central hollow supporting-standard A A, rolls B B, externally mounted upon said standard, pulleys M M, fixed upon the shafts of the outer rolls on one side of the machine, pulleys M M', fixed upon the shafts of the inner rolls on the opposite side of the machine, driving-pulleys W W' upon shaft Y, idlers R R', and X, and belts m m', substantially as and for the purposes set forth.

ROLLER GRINDING-MILL.

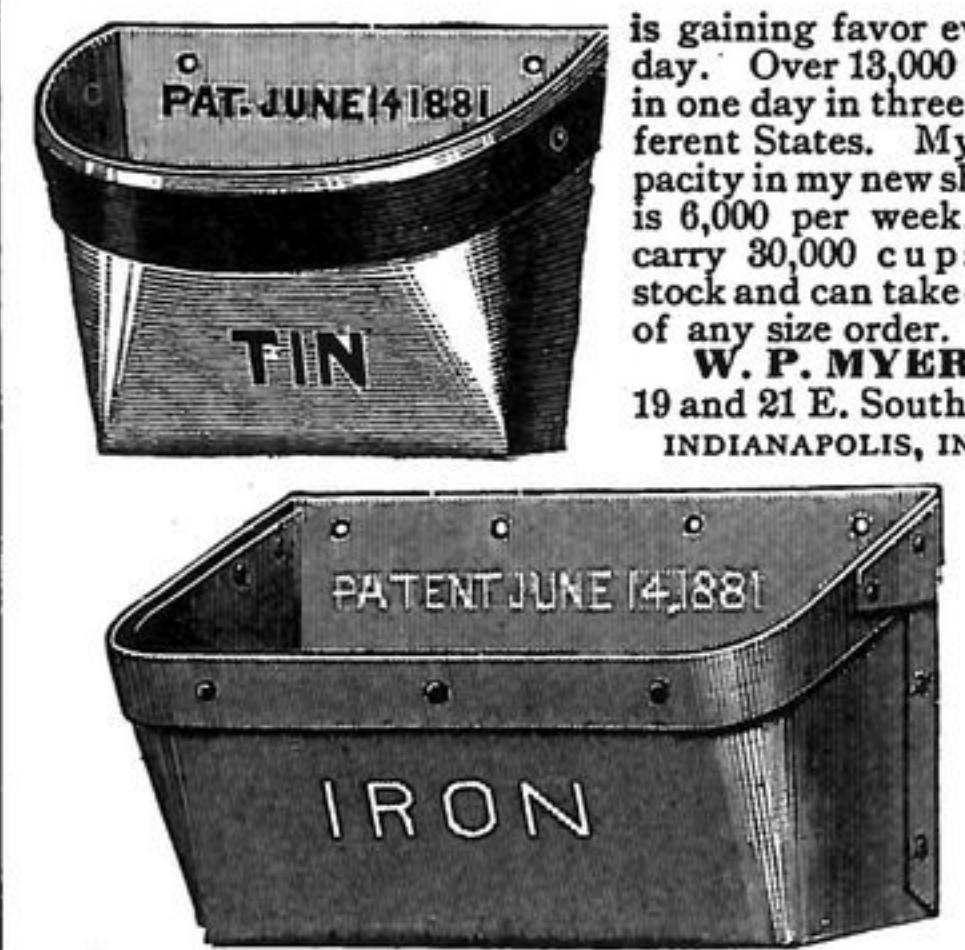
Letters Patent No. 308,254, dated Nov. 18, 1884, to Cyrus T. Hanna, of Allegheny, Pennsylvania. Figure 1 is an end view, partly in section, of a roller-grinding mill embodying this invention; Fig. 2, a side view in elevation of the same; Fig. 3, a vertical section, on an enlarged scale, through one of the bearings of the feed-roll driving-shaft; Fig. 4, transverse section through one of the bed-plates of the frame, with a roll-bearing in elevation; Fig. 5, a side view in elevation of one of the housings of the roll-adjusting mechanism; Fig. 6, an end view in elevation of the same, as seen from the left; Fig. 7, a vertical longitudinal central section through the same; Fig. 8, a transverse section through the same at the line x x of Fig. 7; and Fig. 9 a view, partly in elevation and partly in section, of the adjacent or abutting portions of the worm-shafts and hand-wheels of one of the adjusting mechanisms. This invention, which relates to roller grinding-mills of the class exemplified in Letters Patent of the United States Nos. 253,698 and 272,043, granted and issued to the patentee hereof under dates of February 13, 1883, respectively, is designed to provide for effecting a closer and more accurate adjustment of the rolls toward and from one another than has heretofore been practicable; to enable such adjustment to be effected upon one end of the roll independently of the other or coincidentally upon both ends, as desired; to provide improved means for the vertical adjustment of the roll-bearings, and to enable the tightening-pully to be accurately adjusted in proper position for carrying the driving-belt.

Captain T. C. Butler, of Palatka, Florida, has purchased for his new saw and shingle mill, a Westinghouse automatic engine of 60 H. P.

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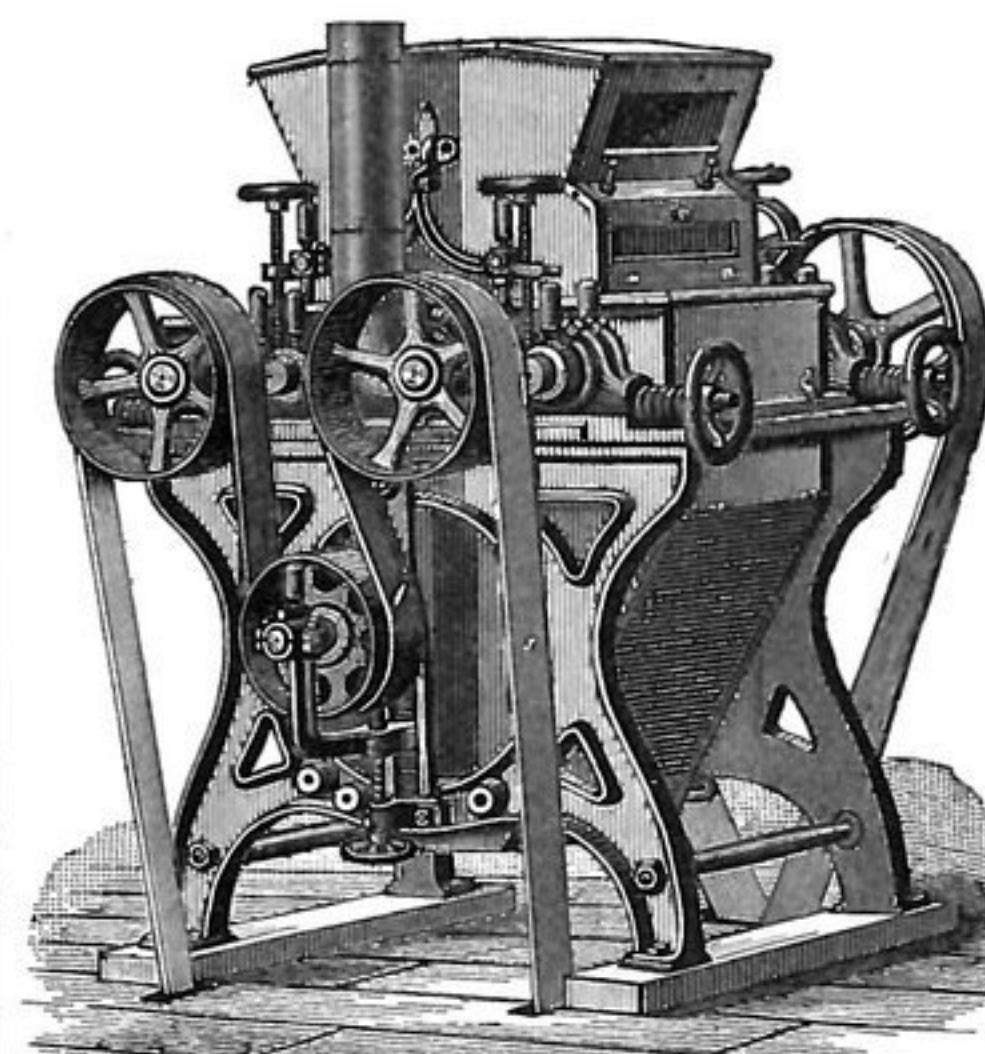
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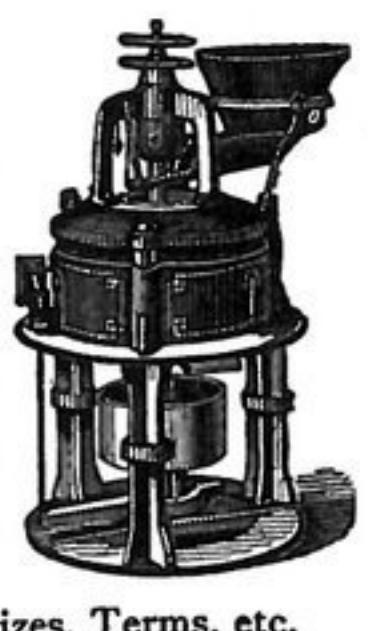
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BOILER INCRUSTATIONS.

From *Die Muehle*.

I.

HOW far are we advanced in the matter of preventing boiler incrustations? That is a very important question and well worthy of attention. Whoever looks over the pages of the technical journals or through the records of the patent office, will naturally come to the conclusion that all misery of steam users from this cause has been abolished, for he is told that such and such a remedy is infallible, as testified to by so many manufacturers. The practical man, however, will say that that is the best remedy which is followed by the smallest amount of disadvantage, and that none of the proposed remedies are perfect in this respect; and that many of them have already done considerable damage. It is curious indeed; theoretically the matter seems to be so simple. The lime salts in the water are the cause of the incrustation. The carbonic acid of the water is expelled during the boiling, and the lime salts are deposited, because they remain soluble only in the presence of the gas. The sulphate of lime, gypsum, is deposited faster and carries mechanically a part of the carbonate of lime with it. Heat will then fasten the lime salts to the iron and the deposit grows in proportion to the quantity of water used. Consequently, a removal of these impurities from the water before its use for steam production; or a prevention of their deposition, or a transformation of these salts into compounds which will not form a deposit; those are the means by which incrustation can be prevented.

Many advices have been offered, for the question is so important that the best talents have given their attention to its solution, and this is the guarantee we have that the problem will be solved finally in a satisfactory manner. Of course there is a reverse side to this: As the demand for ways and means to prevent incrustation of boilers is so large and universal, many long discarded and often ridiculous remedies have been placed on the market by unscrupulous dealers. How many have been duped in this way! The boiler makers know it best from the number of injured boilers repaired. But, like the traffic in patent medicine which can never be entirely prevented because there are always men unable to profit by the experience of others, so the anti-incrustation remedies will always find a sale. He who speculates on the stupidity of mankind, is an unscrupulous, but a successful speculator. Aside from the patent remedies, we have those which can be applied to act mechanically or those which act chemically, and in the following we will review a few of either, together with their action.

Of remedies acting mechanically none of those offered have been found of permanent use. The applications of zinc to prevent incrustation has been beneficial in a certain number of cases, but again it has found many opponents. The efficiency of the zinc can, after all, consist only in the generation of a galvanic current as it oxidizes with the iron, thus offering a protective coating to the latter and expelling the impurities of the water in the form of scum.

THE MATTER OF VENTILATION.

Now that the cold weather of winter is approaching, a few suggestions relative to the ventilation of rooms when artificial heat is used, may not be out of place, says the "Country Gentleman." The subject is of the more importance because many persons do not provide a sufficient amount of fresh air for healthy breathing, while others, in

their over-anxiety to avoid this error, admit a needless amount, and colds and other diseases follow exposure to cold drafts, to say nothing of the waste of fuel. The question naturally occurs, what rule can we have so as to know that we get enough fresh air and not too much? The general principle is simpler than its application. It is this: The average amount of air breathed by every person, is about twenty-four cubic inches at each breath, with about twenty respirations a minute. This would be a cubic foot in three and a half minutes, or 400 cubic feet in twenty-four hours, or the contents of a room 7 feet square and 8 feet high. But this is only a fiftieth part of what every healthy person needs, for breathing vitiates the air rapidly, because the air exhaled has 100 times as much carbonic acid gas as the atmosphere, while twice the amount contained in the atmosphere, or eight parts in 10,000, is as large a proportion as can be breathed without injury to the health. Crowded rooms in winter, schools, etc., are sometimes found to contain three or four times as much, and headaches and other ailments are the consequence of breathing the same air over and over again.

There should, therefore, be enough fresh air for every person daily to amount to 20,000 cubic feet, or enough to fill eighteen rooms 10 feet square and 10 feet high. This would be amply supplied by an opening, tube or orifice, 3 inches square, with a moderate current. In the day time there is usually enough air introduced into rooms through opening doors, cracks in window casings and in other ways. The chief danger is in sleeping-rooms, where pains should be taken to have a circulation. When the room is warm, and the air outdoors is quite cold, constant and often sufficient currents are caused. A warm air furnace properly made gives a constant admission of warmed fresh air. The greatest need is in crowded rooms. A hundred persons should have a ventilating orifice or orifices equal to two and a half feet square. In very windy weather a free ventilation constantly goes on without trouble. A little figuring or calculation will soon enable any person to know how much air to admit into rooms in varying circumstances.

CARE OF BOILERS.

The life of a boiler like that of a human being is dependent upon the condition of things at the start, the usage it has, the material that is fed to it, and the special constitutional and cleanly care accorded it throughout its existence, says the "American Engineer." Besides these, or rather in contradistinction to them there are certain accidents, neglect or trouble that may take place resulting in sudden and certain dissolution, where long life and usefulness were expected. There are boilers that have been in existence for many years and yet their future seems interminable; and there are those again whose usefulness has only just commenced, yet they show present decay and presage constant trouble and expenses for the future.

Here is a boiler sold and sold again for old iron, and yet it is again in use giving out its quota of steam almost as well and as safely as at first; here also is one that, the building being condemned or burned down, is taken out for old iron, but is cleaned, patched and painted and again does duty in one of the newest and finest buildings in the country, and that after a use of over 15 years. Again we have the boiler carrying 90, 100, 150 pounds of steam, quite new to-day but a wreck to-morrow from explosion. Besides this we have the boiler whose very existence seems to depend merely upon a single sixteenth of metal, patched and repatched, and even without the patches, holding out day after day in spite of prediction and evident impossibili-

ties. Like the consumptive, on its very weakness does it appear to live. Many a boiler stands uninsured to-day because it will not pass muster, and yet the possibilities and even the probabilities are that it will be in the same condition a year hence. A boiler may be roughly handled for a time, and then meeting with care and good nursing at the last, finally live out its full usefulness. It is really only those with local disease or trouble that give out suddenly and in so doing do damage to surrounding objects. It is the pent-up force suddenly released that develops the explosion. It is the slight start given the enclosed force by the weak spot that enables the whole contained force to be centered upon the one rupture.

It is with the boiler as with the rest of things, care must be taken that the first incision, the first corrosion does not take place. A good construction at first, carefulness in setting and what is still more important, close examination, cleanliness and capacity to at once note defects and see them remedied are what give long life to a boiler. Hence the advisability of insurance. Specialists are employed to examine the boilers thoroughly, as well as to insist on such thorough examination, the incentive being financial loss in case of neglect. To be sure it might be said that the owner is as much liable as the insurer, and would be just as watchful. If watchfulness were the only necessity then would everything be right, but knowledge and experience in boiler matters are also required, and this the owner, except he be in the business, seldom has. With a person of experience in charge of the boiler plant, postponement, through a lack of proper appreciation of the condition of things on the part of the owner, often leads to serious trouble. But with a notice from the insurance company that the policy will be forfeited, the owner is at once brought to proper respect for conditions and chances, and the repairs are made without delay.

* * We have to utter a word of caution about the ink pencils which have come so much into vogue lately, says the New York Times. A most useful implement to the business man, this innocent-looking pencil can be easily converted into a treacherous friend, and on no consideration should it be used to write the signature of any one. The composition of the pencil is a peculiar combination, highly poisonous in itself, and —herein lies the danger to signature writers—competent to give off two or more impressions on damped paper—not tissue paper, be it understood, but ordinary writing paper. Our attention was first directed to this peculiarity by an astute official of the bank of New Zealand; and subsequent experiments proved the easy practicability of making a clear copy of the filling in of a check with this ink pencil. First the writing of the check is transferred—upside down, of course—to a slip of damped paper, and from that transferred—right side up—to another slip of damped paper. We tested this recently in the case of a check written with the ink pencil and sent in from the country, and by simple hand pressure obtained a very perfect copy of the transferable parts of the document.

* * Place a single drop of the different kinds of lubricating oils to be compared in line across the end of a piece of plate glass about 24 inches long, one end being placed six or eight inches higher than the other, to form an inclined plane, says the "Chem. Review." The drops of oil run down this smooth plane in a race with each other. The quality of the oil for lubricating purposes is shown by the distance traveled and the trace left by the drops. Thus, on the first day, sperm oil will be found in the rear, but it will in time overtake the rest, and retain its power of motion after other oils have dried up. A

light-bodied oil flows quickly, like water, but also dries, whereas what is needed is a good body compared with a limpid flow. Many oils have a good body but have a tendency to gum, and will be distinctly shown upon the glass.

* * A writer in an English technical journal, having explained how cold air is the cause of smoke, which may be greatly reduced by care, remarks that in the open fire grate the existing fire ought to be drawn to the front of the grate, allowing the fresh coal to be placed behind or on the back of the fire; thus, the fire in the front will burn more rapidly, warm the air above and so prepare the rising gases for combustion. In this way the amount of smoke is diminished, as the gases from the coals at the back rise much more slowly than when placed upon the fire and the air partly warmed. For stoves and boilers, warm air may be produced for the entire combustion of all the gases, a result which is beneficial in various ways.

* * What a strike costs a community may be gathered from the following: The committee of the Columbus, O., Board of Trade reported on the 15th inst., the losses caused by the strike in the Hocking Valley since June 17. The loss of trade to members of the board and the coal companies is placed at \$1,600,000; to business outside the board, \$350,000; loss of freight to railroads centering there, \$1,100,000; to furnaces in the valley, \$225,000, making an aggregate loss of \$4,000,000. It is estimated that the city's proportion of the loss is \$1,500,000. The strike is still on.

* * Notice is given of an application to the Dominion Parliament for the incorporation of a company to construct a canal between Lake St. Clair, at the Thames River, and Lake Erie. This canal would avoid the detour via Detroit River and save considerable distance from the upper lakes to Lake Erie ports.

* * The largest and most powerful engine in the world is that of the new Cunard steamer Umbria, which was successfully launched from Cramp's shipyards, Liverpool, June 25. It is a 12,500 horse power.

* * A nine-ton lump of coal, claimed to be the largest ever mined, will represent the interests of Birmingham, Ala., at the New Orleans Exhibition.

* * The Siamese Government has signified its desire to be admitted as a member of the International Postal Union.

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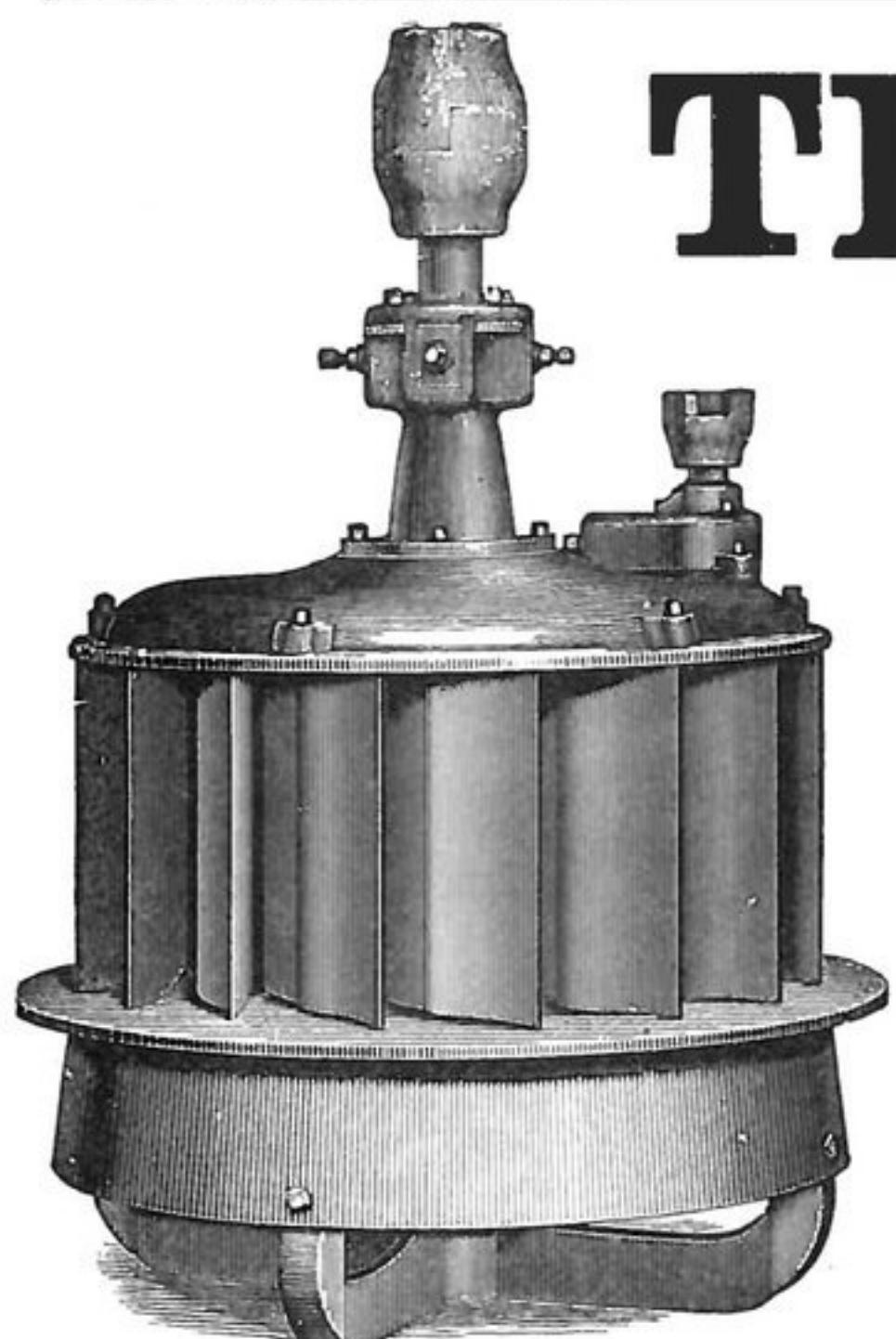
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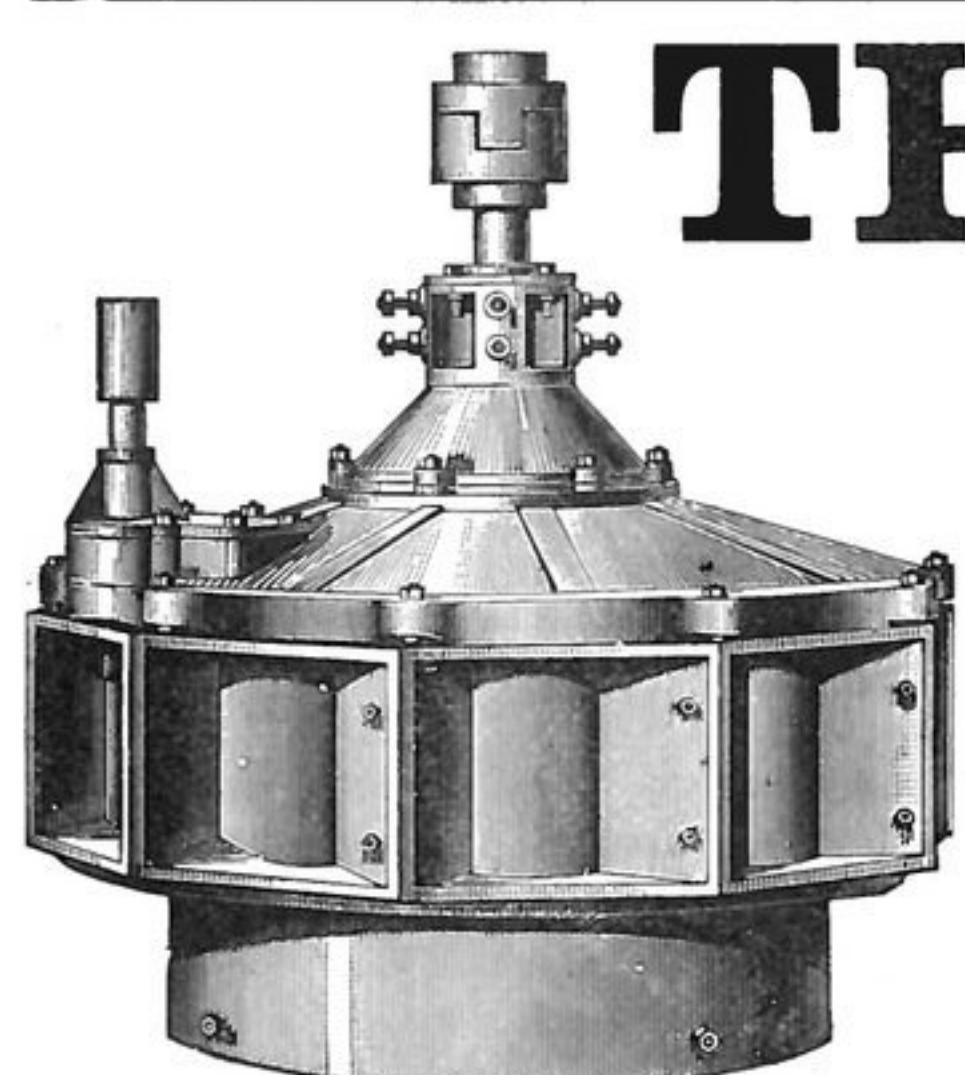
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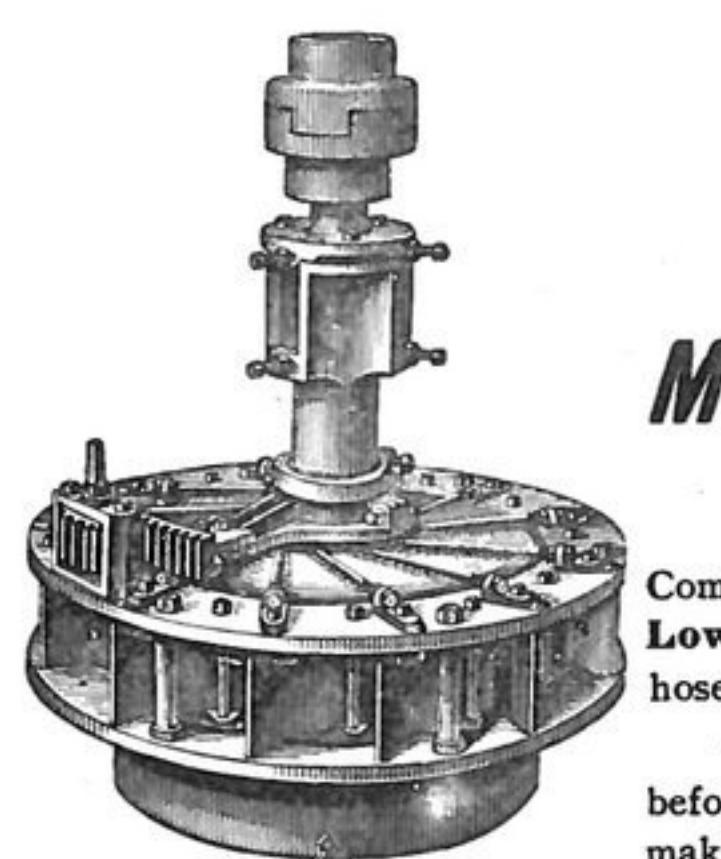
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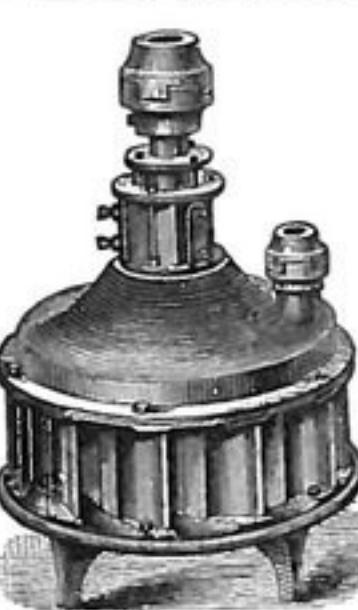


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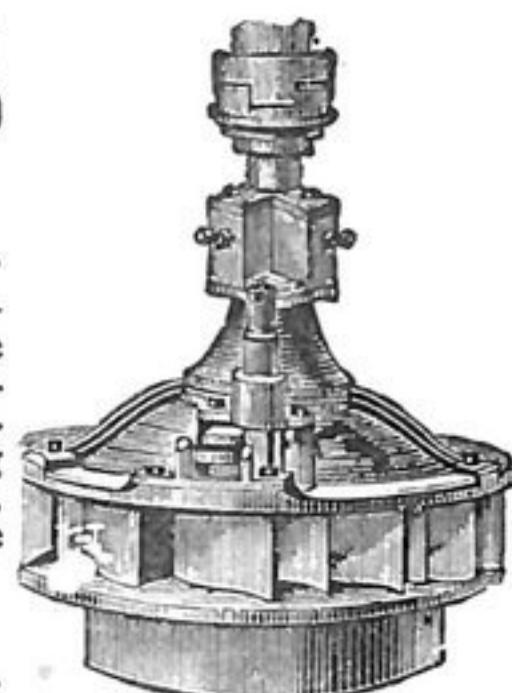
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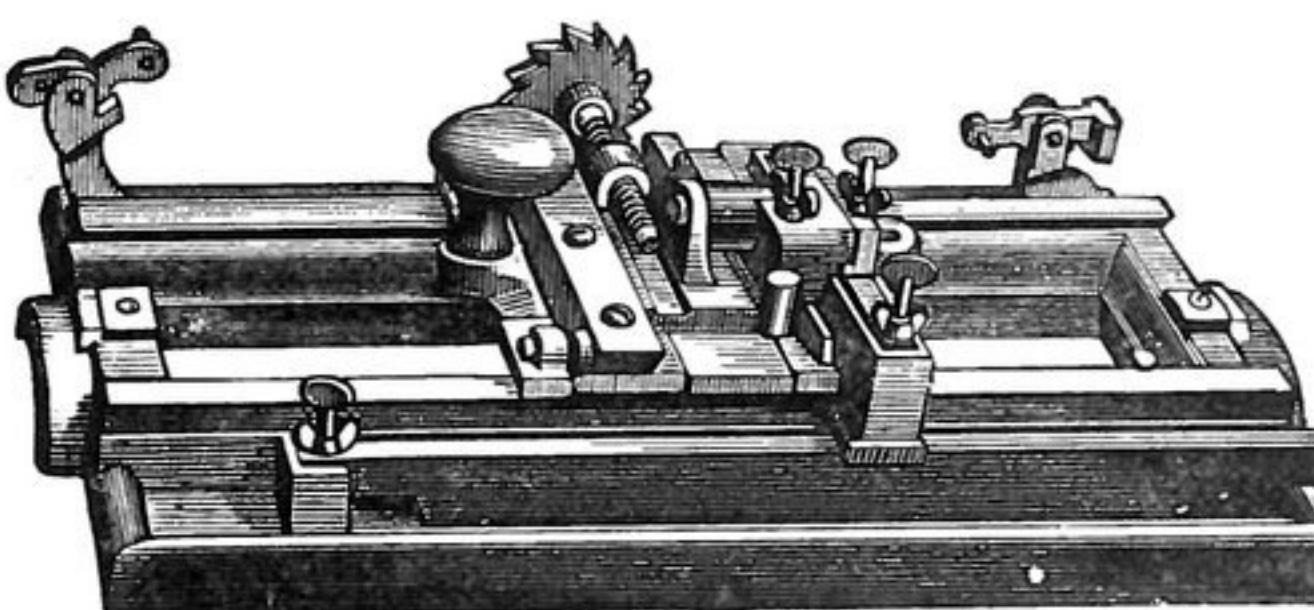
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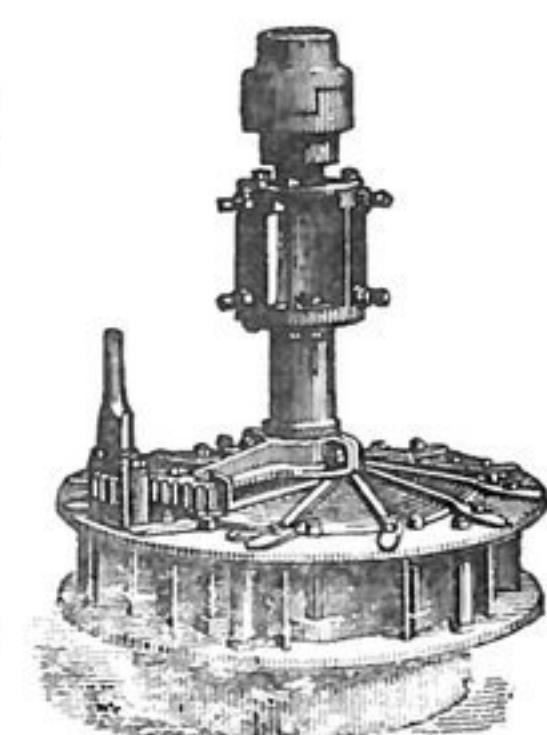
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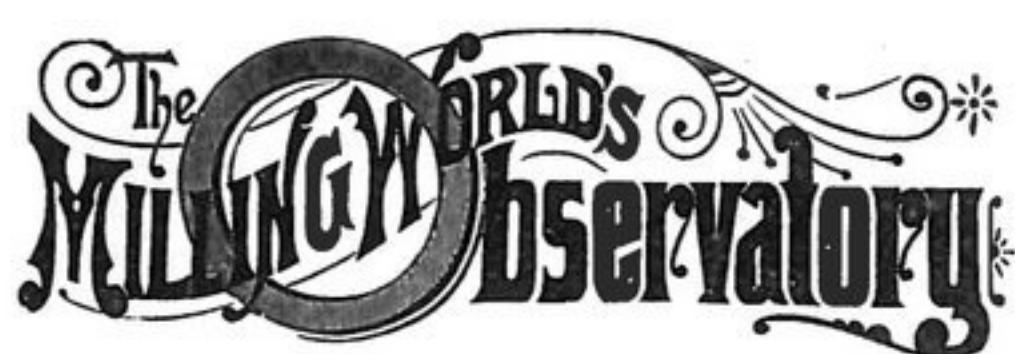
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OUR MINNEAPOLIS LETTER.

[From our own correspondent.]

GOSSIP AND NOTES.

Wm. Poole an old time millwright on the Falls, died at Winamac, Ind., Oct. 27, where he was visiting. Mr. Poole came to this city in 1867, and superintended the erection of several of our mills. He lost his wife about a year ago, and, having no family, this preyed upon his mind and body and hastened his death. Up to a recent date he had been in the employ of the Pray Mfg. Co. The deceased was about 55 years of age.

The electric light has been introduced in the Zenith mill, as has also steam for heating. Thirteen incandescent lights are used, the electricity being furnished by the dynamo-machine of the Washburn A. This makes four mills that are now using the electric light, viz: The Pillsbury A, Washburn A, Northwestern and Zenith. Others have considered the proposition, and though favorably disposed, have not made any move to put in the electric light.

The Crown Roller Mill recently made over 1800 barrels of flour in 24 hours. Formerly 1600 barrels was thought to be the best it could do. The old Dakota, the only frame mill we have, has turned out 310 barrels, when 250 barrels was all it could make on former crops. The Galaxy mill has placed itself on record at 1,000 barrels and the Palisade at 1,465 barrels.

The Queen Bee mill at Sioux Falls, Dakota, of 800 barrel capacity, has done no work this fall.

E. E. Barkham, formerly of this city, together with his brother, J. G. Barkham, has leased the custom mill of J. Winglemire, at Holly, Mich.

The Pray Mfg. Co. is overhauling the Hudson Bay Co.'s mill at Winnipeg. The new machinery used will include five double sets of Livingston rolls, six Smith purifiers, six Peerless dust collectors, Morgan scourer, and four Pye centrifugal reels. The capacity of the mill is to make 200 barrels. Jas. Wright is foreman millwright on the work. The same company also changes over the mill of Hughes & Furguson, at Bathgate, Dak., 75 barrels capacity, and build a new 75 barrel mill for R. C. Munger & Co., at Glyndon, Minn.

W. E. Day recently made a visit to the city to learn the cost of a 125 barrel mill, which he has intentions of erecting at Ipswich, Dakota.

C. A. Pillsbury & Co., have commenced the exclusive use of all oak barrels for their flour, as was their practice formerly. For a few months now barrels made of half elm and half oak have been generally used by the mills, being one cent cheaper than full oak barrels. Pillsbury & Co. are the first to retrace their steps, and a good deal of interest is manifested, particularly by coopers in what the rest of the mills will do.

A. H. Kirk, of Kirk & Fender, and other parties of Minneapolis, have commenced suit in the United States Circuit Court at St. Paul against Louis W. Pruss of this city, for an injunction to restrain the defendant from infringement upon patents claimed by the plaintiff. The complaint sets forth that H. J. Burdick and C. S. Fuller were the original inventors of middlings purifiers, and secured a patent therefor April 7, 1874; that S. L. Bean, was the inventor of millstone exhaust apparatus, and secured a patent Sept. 3, 1878; that this Bean further invented and patented several improvements in balloons for collecting flour dust in mills, dust collectors for flour mills, and millstone exhausts; that A. H. Kirk invented and patented improvements in machines for collecting and saving the fine dust floating in the air and around middlings purifiers and analogous machines in flouring mills, and that Noah W. Holt invented and patented an improvement in dust collectors. Further, that all these several patents were assigned at various times to the plaintiffs. It is finally alleged that the defendant is infringing on these various patents by making, using and selling at Minneapolis, machines for collecting the dust in flour mills, which combine parts and structures secured by patent to plaintiffs. Whereupon the plaintiffs ask the defendant may be compelled to pay them all profits made by such infringement and may be perpetually restrained from further infringement.

The Minneapolis Mill Co., owning the West side water power, and several milling firms leasing power from the above company, have differed as to the amount of power the latter are using, and legal contests may grow out of it. Some time ago the mill company, thinking that the mills were using more water power than they were paying for, had the power used by each, measured.

The result confirmed the company's belief, and it at once asked the mills to pay for additional power. This the greater number of the mills complied with; but a few, it seems, have held out, claiming that the canal is not kept in good condition, and that any increase in charges for power is unwarranted. The board of directors of the Mill Co. have met this by directing the agent of the company to shut off the water of the mills in question, in excess of what they pay for, unless the matter is at once otherwise adjusted. A good deal of bad feeling has thus been stirred up, and the head of D. Morrison, president of the Mill Co., is made a target for pretty strong firing by the millers.

CALEB.

Notes from the Mills.

Ipswich, Dak., is to have a \$10,000 grist mill. Doland Dakota is to have a \$30,000 flouring mill.

Cheboygan, Mich., will have a new roller flouring mill.

A two-run mill is being erected at Shady Grove, Ky., for Jones & Nash.

The firm of Watkins & Sanders, millers, El Dorado, N. C., has dissolved.

A new flour mill is one of the contemplated improvements of Clifton, Texas.

Mr. Lane, of Claremont, Va., has commenced building a new grist mill at that place.

Utah has ten thousand small farms of about twenty-five acres each, all of which must be irrigated.

The Grandin farm, in the Red river valley, is preparing 11,000 acres of land to plant to wheat next spring.

Carter & Gooch, are running their new flour mill at Corbin, Kansas, with a 50 H. P. Westinghouse engine.

Twenty-four thousand bushels of No. 2 red wheat were posted on the Produce Exchange at New York as out of condition.

O. F. Barber, at Golden, Colorado, is building a new flour mill, which he will drive with a 75 H. P. Westinghouse automatic engine.

The Page mill at Fergus Falls, Minn., will be completed and ready for operation early this month. It is to have a capacity of 600 barrels.

The custom mill belonging to John Phelps, on Money creek, near Houston, Minn., was totally destroyed by fire. Loss, \$5,000; insurance, \$3,000.

The Crookston roller mills, of Crookston, Minn., are nearly completed. Their power will be furnished by an 80 H. P. Westinghouse automatic engine.

Fire on Nov. 28, completely destroyed the flour mill owned by John Bidwell, at Chico, Cal. Loss, \$40,000; insured for \$28,000. Origin unknown.

At Toronto, Ont., Nov. 26 the City Flouring Mills, owned by Holmes & Blackburn, burned down. The loss is \$10,000; partially covered by insurance.

The Deerfield River Company, at Hoosac Tunnel, Mass., are building a new saw mill, which they will drive by a 75 H. P. Westinghouse automatic engine.

The largest wheat growers in California are shipping their surplus wheat to Europe, even at present prices, in preference to storing or selling at San Francisco.

Kenyon & Newton, Brooklyn, New York, are overhauling their planing mill. They have pulled out their old engines and have substituted a Westinghouse Automatic of 75 H. P.

Lombard, Ayres & Co. are building a stave mill at Mobile, Ala., which will be run by a 50 H. P. Westinghouse automatic engine. A smaller engine of the same make will be used to haul the logs into the mill.

At Adrian, Mich., Nov. 25, the flouring-mill of Deininger Bros., known as the "Old Red Mill," was destroyed by fire, the origin being attributed to a defective chimney. Loss probably \$10,000, on which there was \$7,800 insurance.

Fire broke out Nov. 28, in Hart's elevator and mill, in Jacksonville, Fla. The elevator, Decotte's woodyard, and one small dwelling were totally consumed. The loss is about \$60,000, and the insurance about \$25,000, in various companies.

Minneapolis parties have begun the erection of a flour mill at Great Falls, Mont., above Benton, which will have a capacity of 100 barrels per day. The dam across the river has been completed, and fully 300,000 brick have been made this season.

Fergus Falls has spent \$250,000 in improvements during the year. The principal items are the Paige mills, which with its elevator and cooper shop, cost \$75,000; a bank building, \$25,000; and a school house, \$25,000. Fergus Falls is a lively town and is bound to be a good one.

The amount of starch manufactured in Aroostook, Me., this season is much larger than usual. It is reliably ascertained that between 9,000 and 10,000 tons have been made in Aroostook county, a quantity equal to the average manufacture of potato starch in the whole country, outside.

The shipment of grain from Portland, Oregon, is becoming an important item in the commerce of the Pacific. Last week six iron ships, wheat laden, cleared the port for Liverpool. Nine hundred tons of wheat is arriving there daily. This is equal to about half the receipts of Duluth.

At Mendon, Ill., S. H. Bradley, proprietor of Mendon Mills, failed. Liabilities, \$40,000; assets, nearly as much. At St. Louis, grain commission firm of Grier Bros., failed. Liabilities about \$40,000; assets unknown. They own about \$40,000 worth of elevator property. Shrinkage in value of grain is said to be cause.

"Down in Kentucky," said a grain receiver of Cincinnati recently, "the fly is undertaking to do something at curtailing the wheat production this season, which the farmers would not consent to do by reduction of acreage in wheat." It is understood that the fall has been favorable to a rather rank growth of the wheat plant.

The Lawrence Machine Company, at Lawrence, Mass., recently received an order for two of their high duty centrifugal pumps, to be used in irrigating the plantation of Franco Verastegui, at Rio Verde, Mexico. One pump will elevate a total lift of 45 feet, and the other pump 30 feet. Both are direct acting pumps, being each coupled to the shaft of Westinghouse engines of 75 and 50 H. P. respectively.

The Paine Lumber Co., of Oshkosh, Wisconsin, have completed their new dry house, which is one of the largest in the country. The arrangement of the fans and power is particularly good. The exhausters, of which there are eight, are overhead, and driven from pulleys on a shaft, in the middle of which is a 20 H. P. Westinghouse engine coupled right and left to it, the engine and shaft making 400 revolutions.

Krieder, Campbell & Co., of Philadelphia, don't make much fuss about the extent of their business, but they keep busy all the time. We have incidentally learned that they are rebuilding a mill at Marietta, Pa., into which they will put two pairs of millstones of their own make, four Odell roller mills, one Garden City break machine, one Trimmer scourer, one rolling screen, two bolting chests, one purifier, and a full line of elevators, shafting, etc.

Joseph Edwards & Co., New York City, N. Y., are building a dredge boat for Captain Eads, for use on the Mississippi Jetties, on the same plan as the one recently built by them for the Okeechobee Land Company. The outfit consists of a 15 inch centrifugal pump, coupled direct to a 75 H. P. Westinghouse engine. The powerful suction of the pump lifts the mud which is agitated by separate machinery and discharges it over a levee or elsewhere, as required.

C. R. Mabley & Co., clothiers, Detroit, Mich., are increasing their plant of United States incandescent lights. Last spring they put in an outfit driven by two Westinghouse engines of respectively 65 and 8 H. P. each, and have now added another engine of the same make, of 45 H. P., with corresponding dynamo capacity. The interiors of their stores are lit on the incandescent system, and the outside fronts are brilliantly illuminated by arc lights on both sides of the street.

Crop statistics published by the Boston Advertiser, show that the average yield of corn in the New England States is nearly 32 bushels to the acre. In the South it is 22 bushels; in Wisconsin, 24; Michigan, 27; Oregon, 28; Indiana, 29; New York and California, 39; Pennsylvania, 31; Missouri, 34; Iowa, 35; Nebraska and Kansas, 38. The large average in New England, as compared with other Northern States out of the corn belt, is probably due to smaller acreage and better farming. The poor yield in the south results from poor farming.

The Omaha & Grant Smelting and Refining Co., at Omaha, Nebraska, has purchased a second Westinghouse Automatic engine of 80 H. P. The engine is used to drive crushers, and was selected principally on account of the uncertainty of the foundation which could be obtained, and the desired protection from the dust and grit in the atmosphere. The engine when first set up was run for an hour light, and was then put to its full work and run continuously for over two weeks, nights and Sundays included, with but two or three stops of five or ten minutes each, necessitated by the machinery.

Marionville, Lawrence county, Missouri, on the main line of the St. Louis & San Francisco Railroad, has suffered a great loss by the recent destruction by fire of the flouring mill located there. Marionville is claimed to be one of the liveliest

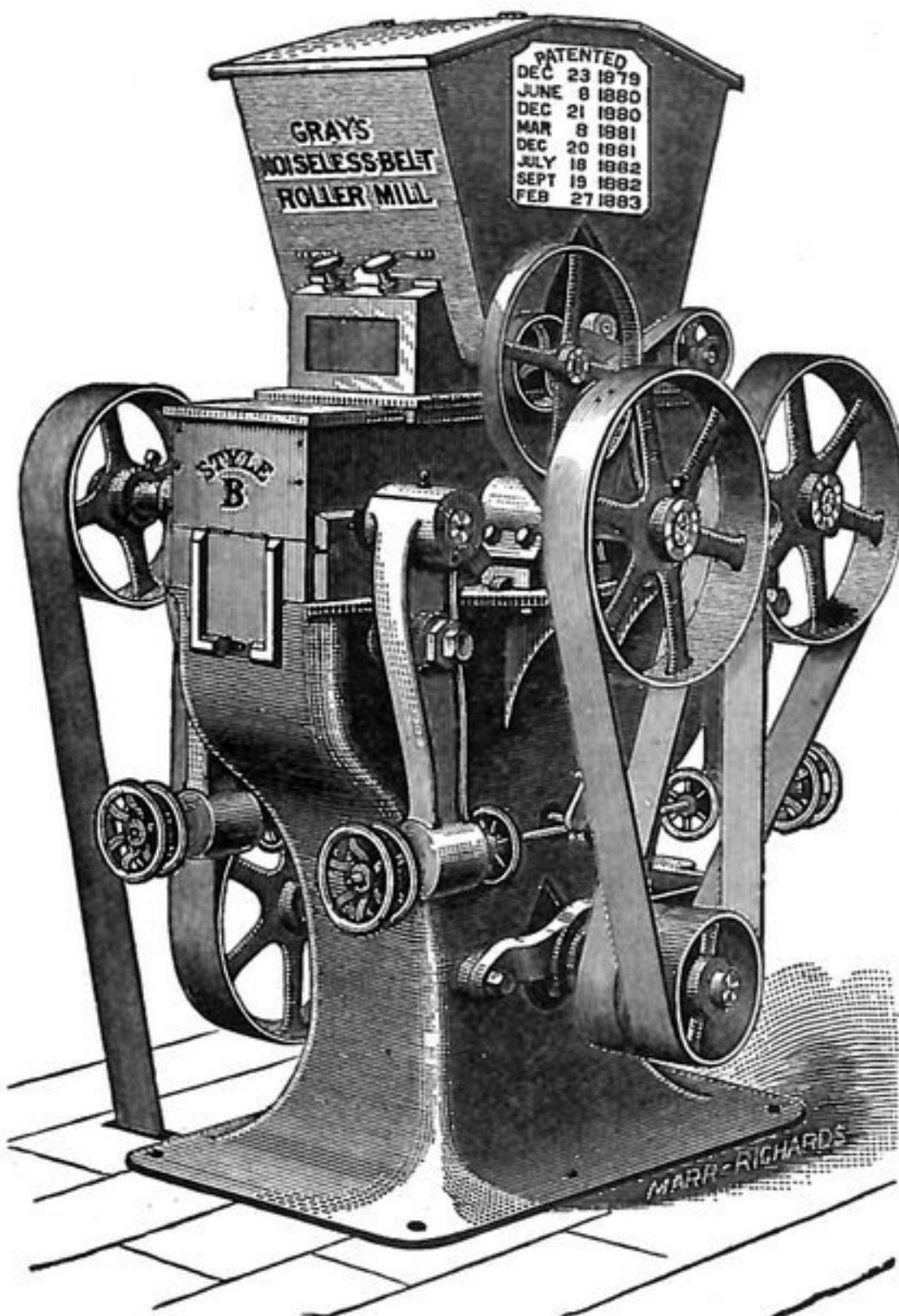
towns in southwest Missouri and is surrounded by as fine a country as there is in that section of the State. It is as good an opening for a flouring mill as can be found. Parties desiring to engage in the milling business and who have \$10,000 to \$20,000 to invest will do well to correspond with Edward Sinclair, who will take pleasure in giving all information desired.

The Westinghouse Machine Co., of Pittsburgh, Pa., have been partially shut down for a month, in order to set new tools, enlarge their foundry, and build a new erecting shop and store room. They will start up again on or before December 1st, with a capacity of 100 engines per month. They report trade as steadily growing, notwithstanding the depression of the times and the distracting influences of the campaign. The business of the month of October was, in fact, the largest in their experience, their sales amounting to 75 engines. Their output for the month of September was 2,500 H. P., and the month of November promised to be still larger. They have recently made contracts with responsible parties, which insure the sale of the entire product of their works when increased to the capacity above noted, and work will be prosecuted vigorously throughout the winter.

The failure of the grain commission firm of Grier Brothers St. Louis, Mo., was caused by the inability of the firm to meet an acceptance which fell due the previous day. Believing, however, that they could readily obtain a renewal of the acceptance, they checked out \$6,500, but the checks were thrown out by the banks. Gen. Grier said that these checks represent the entire unsecured indebtedness of the firm, outside of several thousand dollars due the Bank of Commerce. That bank also held secured paper for a large amount. He said the failure would be a small one, not to exceed \$20,000 to \$25,000, and he expects to resume in a short time. None of the firm's money of late, he said, had been lost on options. He had a line of about 40,000 bushels of grain out for Louisville parties who were perfectly responsible. The firm's losses had been caused by a decline in the market which had not been expected.

"We understand," says the Montreal *Gazette*, "that Mr. Alex. Mitchell, the well known grain merchant of this city, has left for Manitoba, for the purpose of buying a large portion of the surplus wheat crop of the Northwest. Mr. Mitchell will act as the agent of a number of capitalists here, and it is his intention to purchase a million bushels or more, which will be stored at Port Arthur during the winter, and shipped to Montreal for export to Europe, after the opening of navigation next spring. The financial arrangements for this transaction have been completed through the bank of Montreal, and the Canadian Pacific Railway Company, in view of the magnitude of the operation, has, it is understood, given a favorable rate for the transportation of the grain from western points to Port Arthur. Many advantages will accrue from this enterprise. The farmers of the Northwest will be afforded a ready market for their wheat, the railway be provided with a large traffic, the elevators at Port Arthur and Fort William be employed to their full capacity, and an active carrying trade from Thunder Bay to Montreal be assured in the spring."

Commissioner George B. Loring of the Department of Agriculture, has submitted his annual report to the President. The report of the statistician shows that between 1860 and 1880 the value of meats increased from \$300,000,000 to \$800,000,000; of corn from \$360,680,878 to \$694,817,304; of wheat from \$124,635,545 to \$436,908,463; of hay from \$152,671,168 to \$409,505,783; of dairy products from \$152,350,000 to \$352,500,000; of cotton from \$211,516,625 to \$271,636,121, and the other products in proportion, more than doubling the aggregate of value and increasing it from \$1,600,000,000 to \$3,600,000,000 in round numbers. With good prices the current production of the agriculture of the United States can be little short of \$4,000,000,000. The present year's history of crop growth in the statistical bureau indicates a production above the average. The cotton crop has been injured by the drought, yet it promises to exceed 6,000,000 bales. Corn apparently averages twenty-six bushels per acre, which is about the average of the prior period of ten years, giving a crop not heretofore exceeded in absolute quantity. Wheat has made a yield of fully thirteen bushels per acre, and a product exceeding five hundred millions. The supply of cereals will average fully fifty bushels for each inhabitant. Potatoes of both kinds are fairly and other products generally in full supply. On the subject of forestry, Commissioner Loring says that while the destruction of forests is going on at a constantly increasing rate, the work of planting trees is rapidly increasing.



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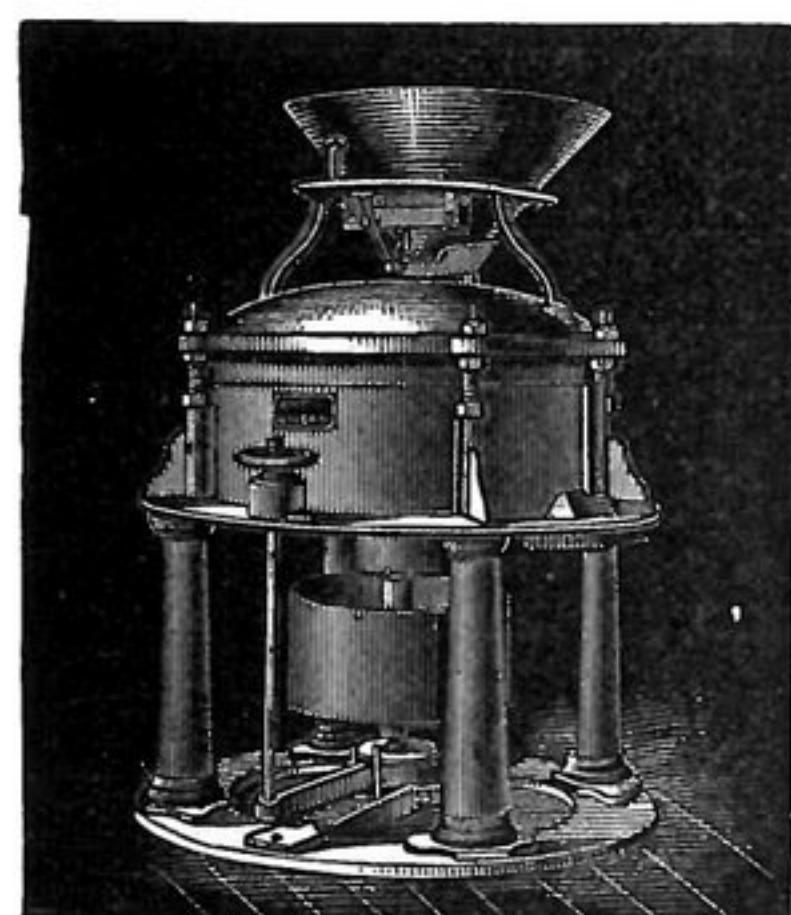
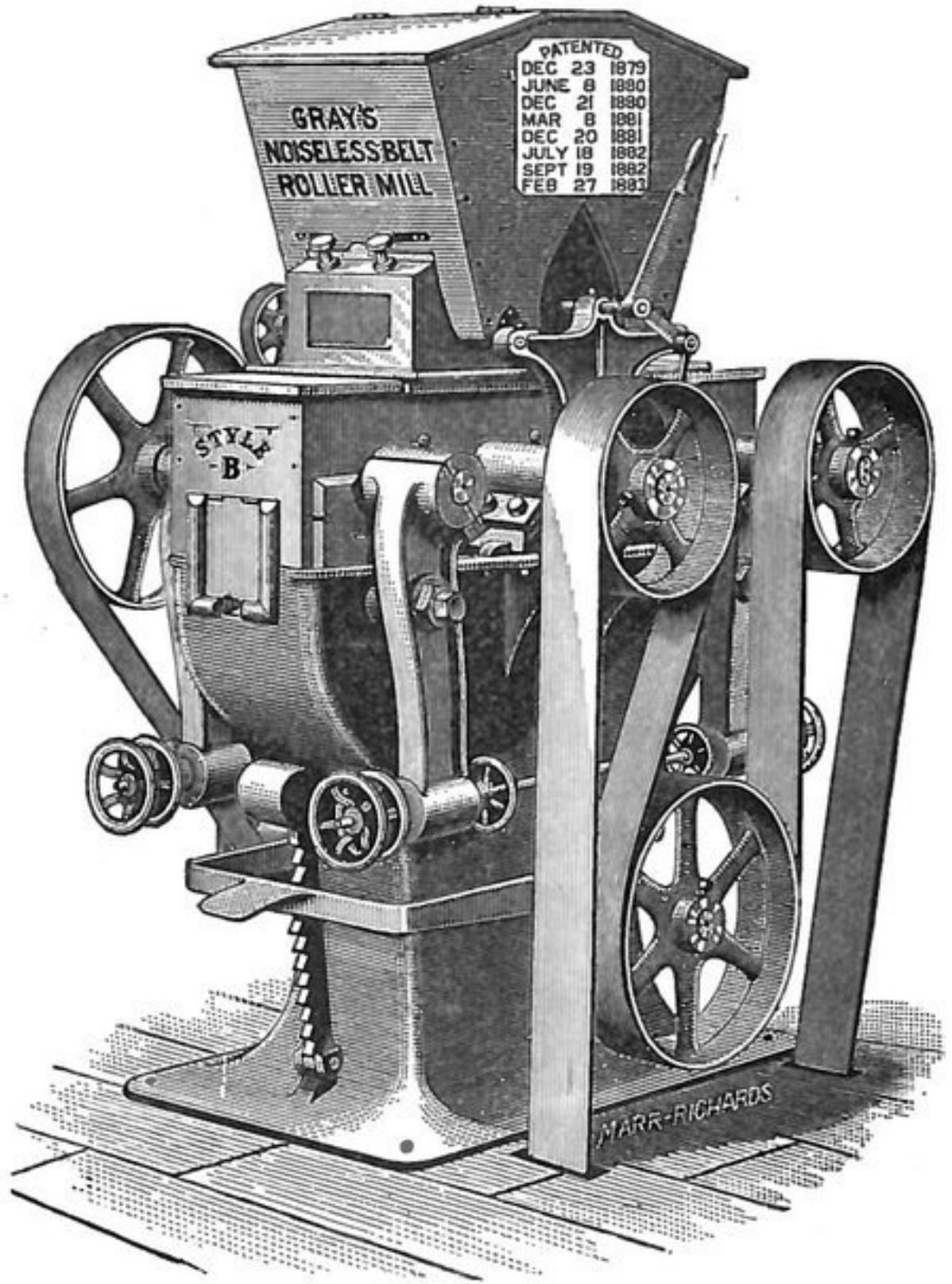
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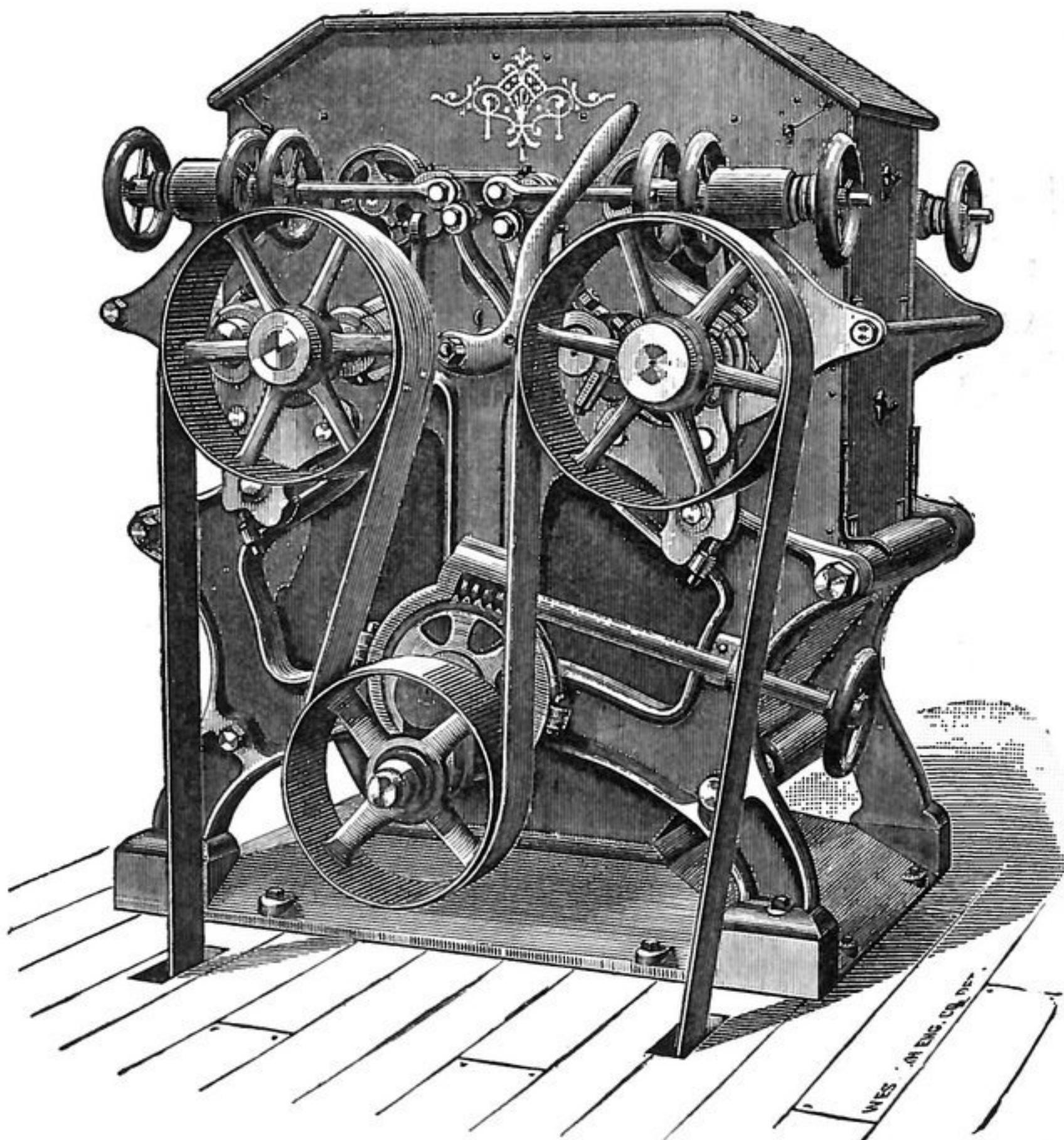


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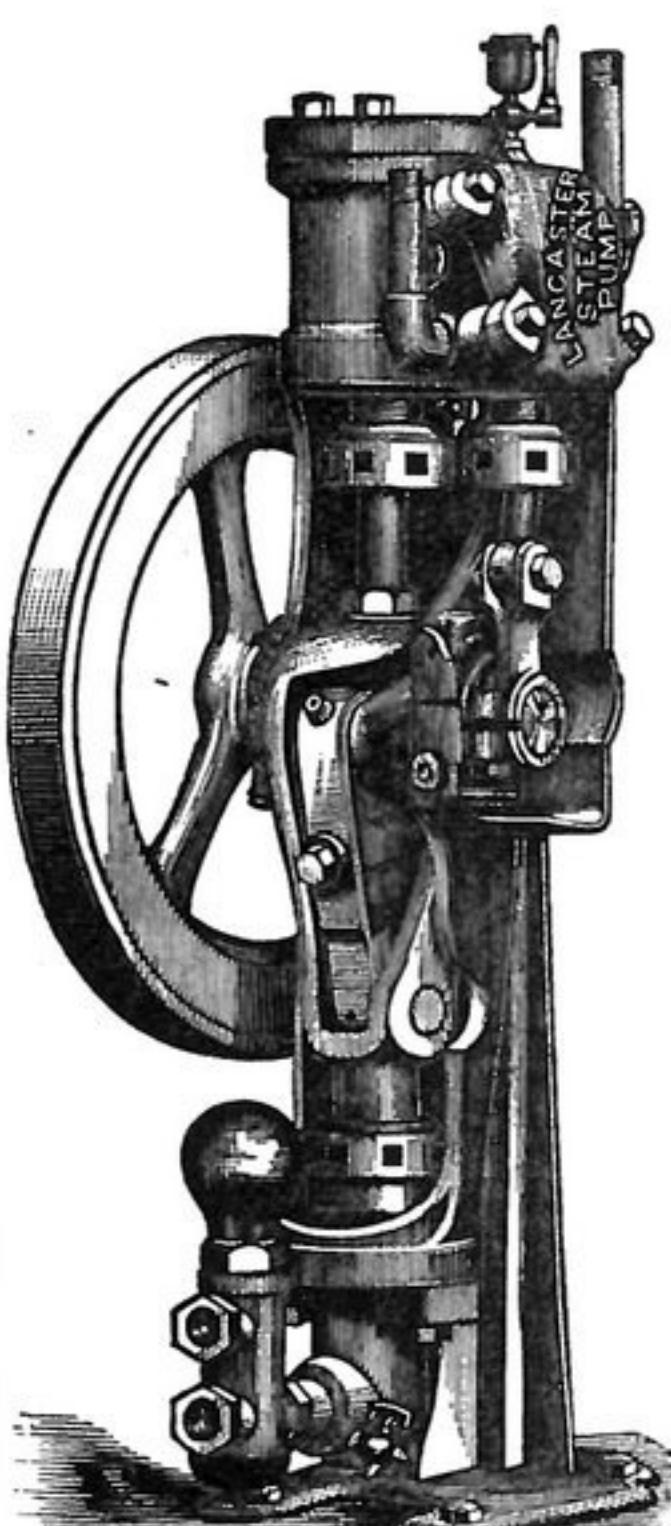
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A TRIANGULAR CONTEST FOR SUPREMACY IN THE MANUFACTURE OF FLOUR.

HUNGARIAN flour has long commanded a much higher price in the London market than any other kind, and it does now; but this is chiefly due to its superiority over other sorts in the manufacture of choice and fancy pastry, and not to its greater merits for bread making purposes, says the Produce Exchange Reporter. The following quotations made in London, now and one year ago, for the highest qualities of English, American and Hungarian flours, are interesting:

	1884	1883
per 280	per 280	lbs.
London Top Price Brands.....	35s. 0d.	40s. 0d
Spring wheat Patent "Superlative".	35s. 6d.	44s. 6d
Hungarian—Victoria Empress.....	45s. 0d.	50s. 0d

It will thus be seen that Hungarian flour sells for about 10s. per sack or, say, \$1.68 per barrel more money than either the best English or American. It will also be noted that while English and Hungarian flours have declined only 5s. per 280 lbs. during the year, American has fallen 9 shillings. Of course there are reasons for this difference in the reduction of values, but at this moment we are not prepared to give them. It may be said, however, that apart from the superior pastry qualities of the Hungarian flour, its higher price and the better maintenance of it are doubtless, to some extent, due to the fact that it is largely used in the families of the nobility and wealthy classes, and by the fashionable bakers who provide pastries for their entertainments.

Now if the best English and American brands are not as good for pastry preparations as the Hungarian, it may not be out of place to inquire why not? Is it because the wheat from which these flours are made lacks some particular quality possessed by the Hungarian; or, is it owing to the superiority of the machinery and skill used in the manufacture of the Hungarian? More than likely all have more or less to do with the superior quality of the Hungarian flour for pastry baking. At the best, it is not a matter of any very great importance, since the quantity of flour used for pastry is a mere bagatelle compared with that made into bread, and for the latter purpose, there is no flour in the world that will produce better bread than the flour made from our No. 1 hard spring and best grades of winter wheat. But prestige, and without doubt prestige only, still gives the Hungarian flour the lead in price in the London market for pastry making purposes. This prestige, however, is passing away, and ere long will no doubt become a thing of the past. For British millers have become thoroughly aroused, if not alarmed, by the almost ruinous competition forced upon them by those of this country and Hungary, and at last are rapidly preparing themselves by the only means in their power to check the tide that has in late years set so strongly against them. We refer to the reorganization of their mills—the substitution of rollers for millstones, and of other modern methods for those which among, merchant millers at least, have in a great measure gone into disuse. In England, as in this country, the millstone will for many years to come no doubt continue to be used, but more particularly by small mills in the provincial districts. At the great milling centres in both countries, millers must change to the roller system, and employ every other modern invention that will improve the quality of the product, and at the same time lessen the quantity of wheat from which a given amount of it can be made. Thus far, American millers have led the British in these improvements, and with them have crowded the British so hard that the competition resolved itself very largely into the question of whether they should quit milling

or adopt the methods by which American and Hungarian millers had rendered their business comparatively profitless, if not worse. If "eternal vigilance is the price of liberty," our export millers may in the not far distant future find that the same maxim may have some application to the price of flour in their competition with the British. However, we have no doubt but that they will be equal to the occasion, although it looks very much as if the competition in store for them in the future would be somewhat sharper than it has been in the past, and that in consequence thereof, greater demands will be made upon their skill and energy in order to maintain the commanding position they have labored so long and so hard to achieve.

FOREIGN NOTES.

Baltic Sea ports are blocking with ice. Close of navigation for the season is imminent.

The drouth in Australia continues to be complained of, and the crops, which are approaching maturity, are expected to be very deficient; this will not be without influence in the early part of next year.

Another large rice mill working by steam power has just been completed at Saigon. Under the auspices of a German firm a company has now been formed which is about to erect a similar mill, making the fifth steam rice mill in this district.

Advices from Boulogne-Sur-Mer state that the bread difficulty is apparently spreading to the provinces, meetings having been held in different towns to consider the question. The bakers of Entraygues (Aveyron) have been on strike for three days, on account of the Municipality of that place having decreed a reduction of 10 centimes in the price of bread.

The failures in the United Kingdom for the week ending November 8, reported to *Kemp's Mercantile Gazette* numbered 91, as compared with 170 and 226 in the corresponding weeks respectively of 1883 and 1882. England and Wales had 74 failures, as compared with 152 and 208 in the weeks specified; Scotland had 15, as against 15 and 12, and Ireland and 2, as against 3 in 1883 and 6 in 1882.

The European wheat crop of 1884 is larger in quantity to that of 1883, but the excess is very far from being equal to the deficiency of 11,000,000 bushels on the European stocks at the beginning of the crop season of 1884-85. It is calculated that in 1883, at the beginning of the crop season of 1883-84 there were in Europe about 113,000,000 bushels of old wheat that had been carried over from the previous crops of which much was of inferior quality.

Berlin telegrams, of November 3, state that the report lately circulated by some newspapers that a Ministerial Bill was in preparation for raising the corn duties, is declared, in well informed quarters, to be wholly unfounded. On the other hand, the agricultural interest in France ask for a tax of 7 per cent. per qr. on wheat, 8 per cent. per sack on flour, and 4.3 per qr. on rye, barley and oats; and it is said that the majority of the Chamber is in favor of protection.

A meeting of Bohemian and Moravian millers, recently held in Prague, was attended by some 250 persons interested in the trade. Those present passed a resolution in favor of a restriction of the admission of Hungarian flour into Bohemia and Moravia. One worthy miller declaimed fiercely against everything Hungarian, and urged that the Bohemian people, especially the women, should patriotically support the native industry by buying no more Hungarian flour.

On November 13, the flour mill of Messrs. Harris Brothers, Belfast, was destroyed by fire. The flames spread to the utmost limits of a large three-story building, and the greater portion of the roof was burned away. Seven lines of hose were laid. A store containing 500 tons of flour was saved. This store has a felt roof, and had the flames extended to it the contents would have been completely destroyed. The fire originated in the mill to which it was confined. The loss is considerable, and is covered by insurance.

Agriculture in Normandy is in a most depressed state, and farmers and proprietors in this usually productive district grow poorer year by year, thanks to the reduced price of land and excessive foreign competition. Although the late harvest was exceptionally good throughout the department of Calvados, numbers of farmers try to cancel their leases or else go off altogether; while the landowners find their property either taken at half price or going a begging. Land has gone down fully a third in value between Caen and the sea, and property is put up to sale without a between.

With reference to the test by an American miller of a "Cummer" engine, says the *Millers' Gazette*, we have been favored with a view of the yearly record of a certain mill, since 1873; in that year it was a stone mill; the year's output was then 43,100 sacks of flour, and the quantity of coal consumed, per sack, was 53.515 lbs; gradually the mill was improved to a half-high grinding system, and finally, in 1882, to a gradual reduction mill, on Nagel and Kaemp's system. In the year 1883, the amount of flour turned out was increased to 92,715 sacks, and the consumption of coal per sack reduced to 35.118 lbs. There was thus an increase in the output of 114 per cent and decrease in the consumption of coal per sack of 34 per cent, with the same building and the same engine.

The greatest readers of newspapers in the world are the Hungarians. It is said that the peasants in that country, with very rare exceptions, know how to read, take an active part in public affairs, discuss and judge political measures, and are often elected members of municipal bodies. Mme. Adam, who recently wrote a charming book of travels in Hungary, was told that there is not a town without its literary club. In the cafes you find as many papers as in France. The most insignificant journal has its readers. A city of 25,000 inhabitants is mentioned where, among its numerous clubs and restaurants, there was one that took in 105 newspapers, dailies and weeklies—an incredible number. The list is posted up in the establishment, and includes journals in Hungarian, German and English, treating of politics, literature, agriculture, education, and even the fashions.

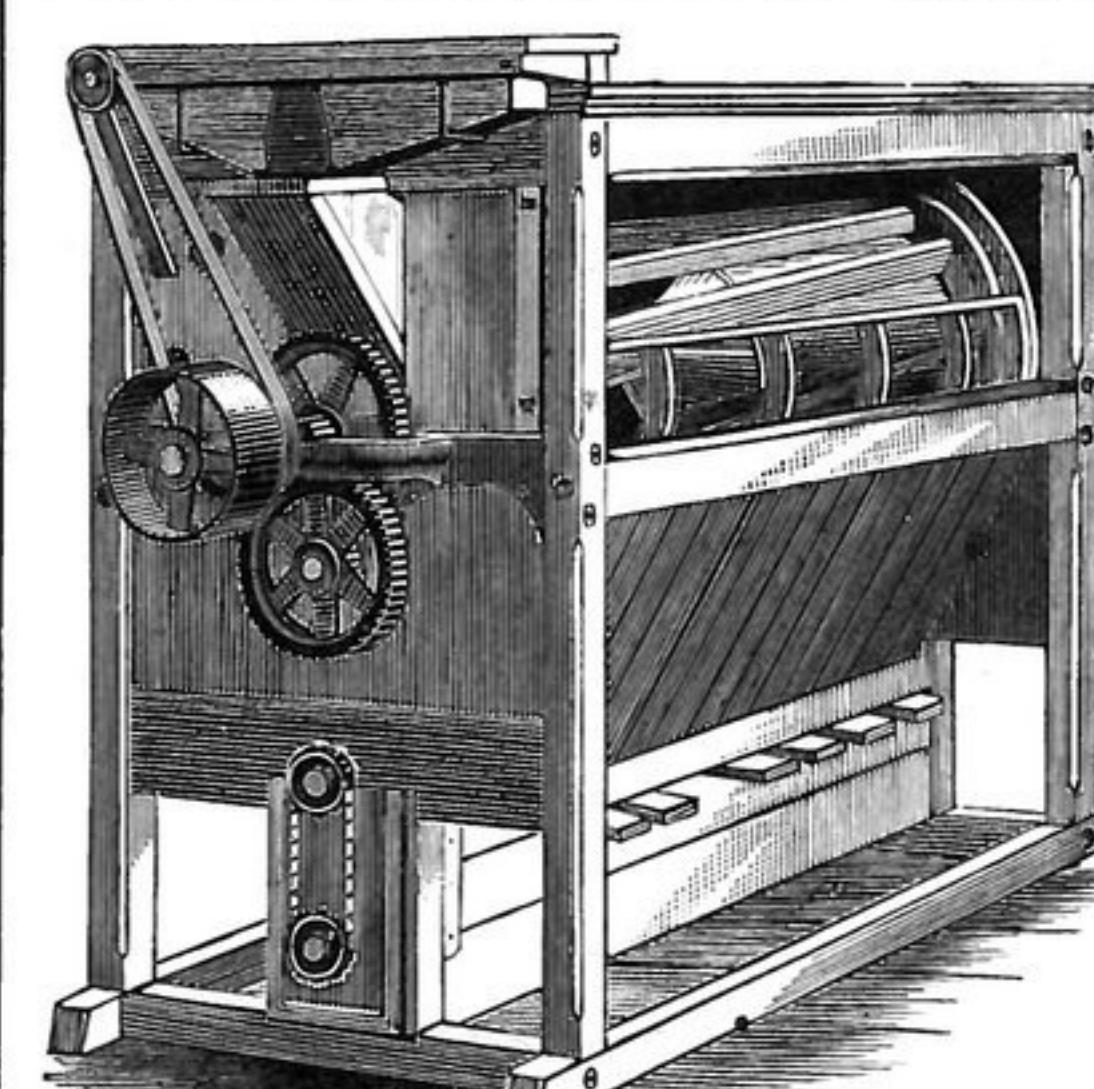
The French wheat crop, per official report as given by cable, is for 1884, 111,141,845 hectolitres of 2.83 bushels each, equal to 315,420,556 bushels, against 103,753,426 hectolitres for the crop of 1883, equal to 294,452,223 bushels, being an increase of 20,968,333 bushels. The *Bulletin des Halles* expresses the opinion that the official estimates of the last three years have been larger than justified by the results. The rate of consumption in France of wheat is quite well determined. The crop, on the basis of official estimates, for the last three years and the determined consumption should give very large wheat reserves, which it is well known did not exist on July 31, 1884. The foreign wheat requirements of France for the twelve months to end on July 31, 1885, are estimated at about 40 million bushels. If the wheat crop of 1884 in France is as large as the official estimate, considerably less than 40 millions of bushels of foreign wheat will probably be required.

According to the Board of Trade returns, issued on Nov. 7, England has imported during the ten months ended October 31st, 41,525,783 cwt. of wheat and 12,604,816 cwt. of wheat flour and meal, as compared with 56,146,176 cwt. and 13,761,610 cwt. in the corresponding period of 1883, and with 55,483,545 cwt. and 10,180,206 cwt. in the first ten months of 1882. Taking values into

account, our bill for foreign breadstuffs for the last ten months was £26,350,007, as compared with £19,379,379 for the corresponding period of 1883, and with £38,294,447 for that of 1882. These differences represent a saving this year, so far, of £11,829,392, as compared with expenditure on foreign breadstuffs in 1883, and of £11,944,440 as compared with that of 1882, says the *Corn Trade Journal*. Imports of barley, oats and maize have also been considerably less, those of beans a little less, and those of peas a little more than in 1883. Our total expenditure for foreign corn, flour, and grain for the period referred to has been less than that of last year by £16,774,947. A portion of this is only temporarily saved, as our stocks are low, and we shall have to import more extensively later on; but a considerable proportion of the saving is due to low prices. Thus, the wealth of this country will be greatly increased by the more or less abundant harvest of the world, though producers here and elsewhere will fare badly.

In its latest cabled report the London *Mark Lane Express* says that the new English wheat hardly looks stronger. The decline of 1s. per quarter for wheat in London on the 17th inst. has not been followed by a reaction. In fact, the market is still relatively weak. Farmers' deliveries are still smaller than last year at the corresponding period, while prices received by them are 3s. rd. per quarter, against 4s. 5d. a year ago. The pressure of American flour on that manufactured in the United Kingdom has evidently had its effect, for flour declined 2s. "under a pressure from the London bakers" who had reduced the price of bread. Foreign wheats in London were reported to be gradually sinking "toward an unfathomable bottom," and how long it would be before that bottom would be reached was a matter of pure speculation. Maize was firm owing to scarcity. Oats were 6d. per quarter lower. Another authority writes of the English wheat market that it has seldom been so stagnant as at present, "when stocks of wheat and flour were such as are now in hand." The profusion of market garden products is said to be curtailing the demand for flour and a warm temperature had added its influence. It was thought, however, that millers and bakers, whilst they might be vexed at the slowness of trade, should still be making flour and bread at some profit, but the wheat grower and wheat merchant, besides the slowness of business, were suffering loss instead of gaining profit. The retail demand for wheat flour in Germany is reported to be gaining. In Spain insects and drouth have "done terrible damage in certain districts," but elsewhere over an average crop will be secured. In Italy the price of wheat remains at an average of 40s. and the demand is not freely met. The London *Miller* says that the establishment at New York "of a really good grade of winter red wheat should have a highly beneficial influence upon trade." Later cables from London, Liverpool and Paris have been stronger.

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IS BEYOND QUESTION THE
BEST IN THE MARKET
AND IS SOLD FOR
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While the operation of every
Machine is
FULLY GUARANTEED.

Send for Prices, Lists of
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OFFICE OF LUDLOW MILLS, DAYTON, OHIO, April 23, 1884.

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CHAS. SHUEY, Head Miller.

CHAS. S. DURST, Supt.

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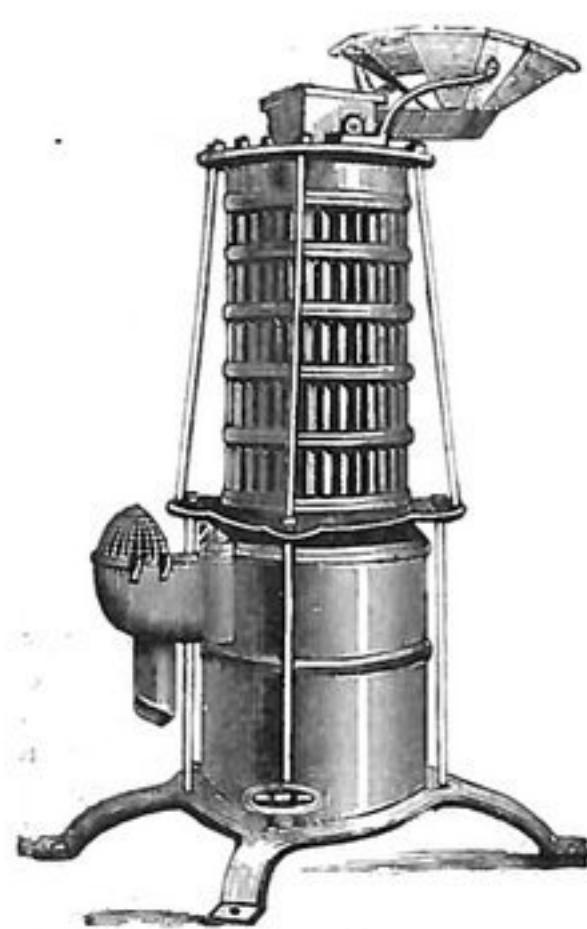
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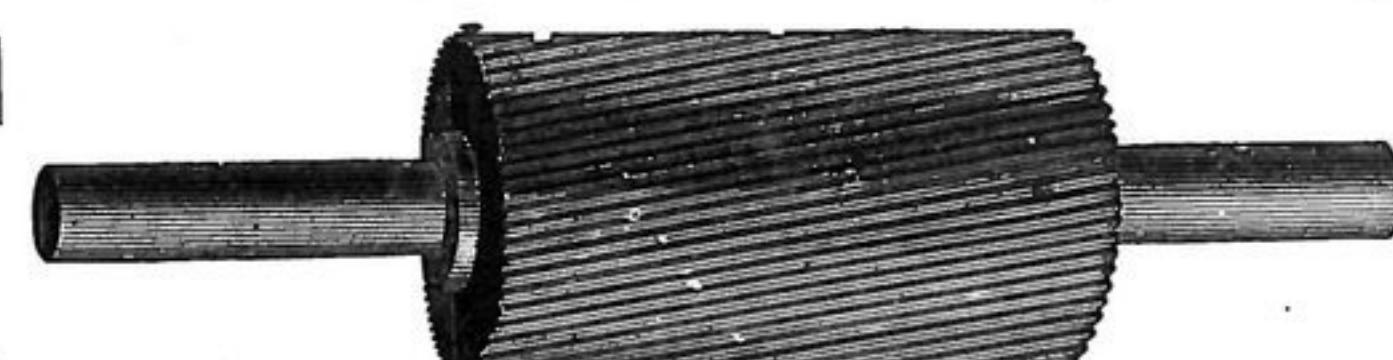
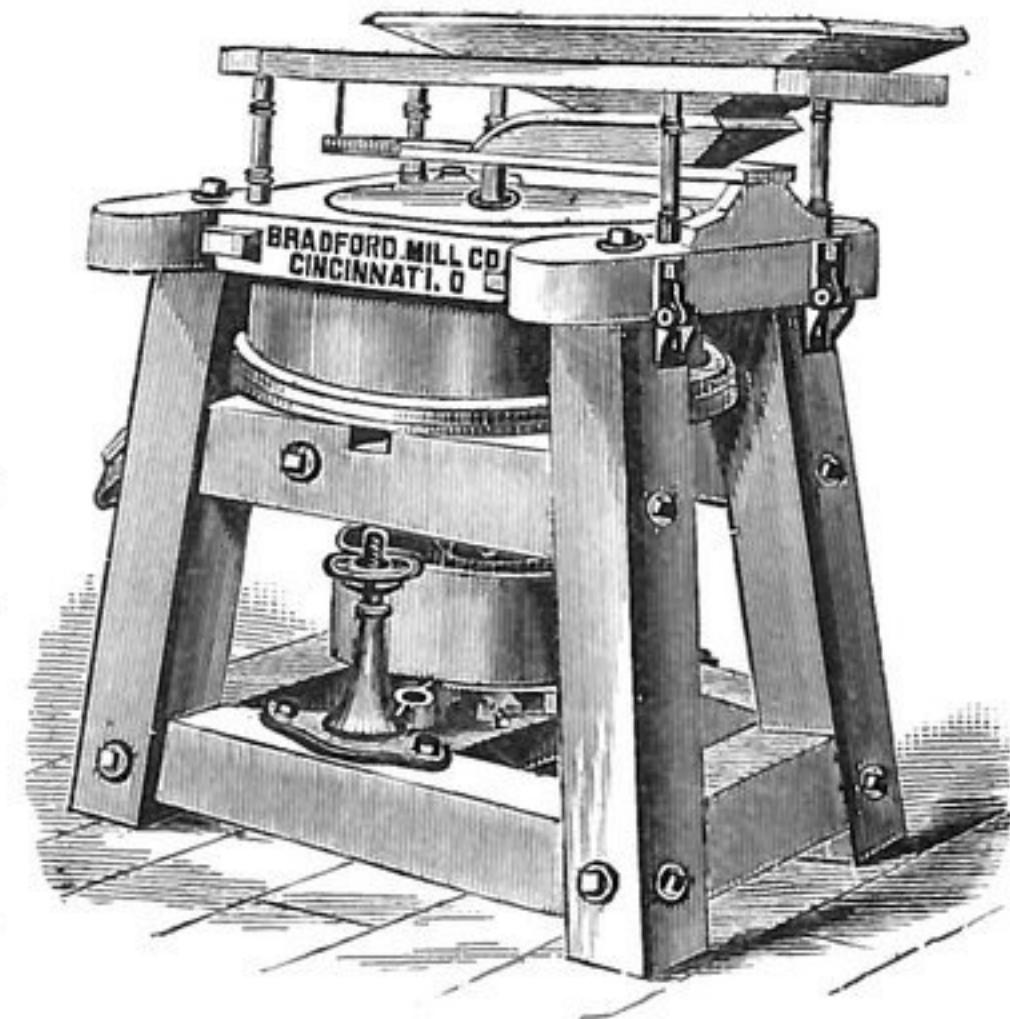
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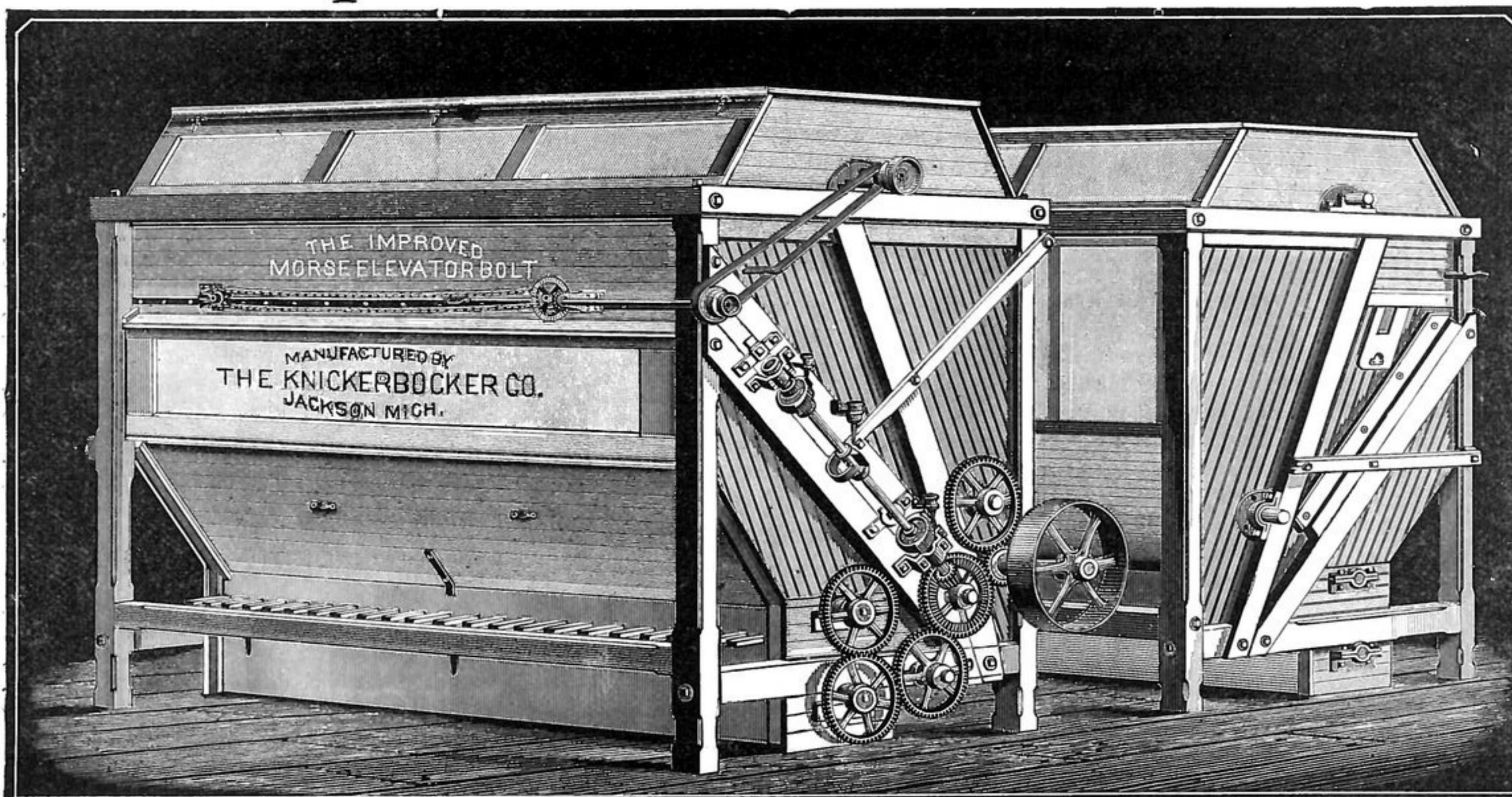
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DEMONSTRATED IN OVER 100 MILLS TO BE THE BEST BOLTING DEVICE KNOWN.

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All Warranted made of Best Quality Cast Steel 50 cents per pound.

All Sizes in Stock.

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SAMUEL CAREY, No. 17 BROADWAY, NEW YORK.

CAREY'S DOUBLE ANCHOR BOLTING CLOTH.



A tool for Cutting, Leveling and Polishing the Furrows and Face of Millstones.

Eight inches long, $2\frac{1}{2}$ inches wide, $1\frac{1}{2}$ inches thick. Received the highest and only Award given to Polishers at the Millers' Exhibition, Cincinnati, Ohio, June, 1880.

For facing down high places on the buhr, this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. It is much larger, cuts better, can be used on either face or furrow, can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over four times the amount of corundum and when the corundum is worn out can be replaced in the handle at a small cost. Sent by express, \$3.50. Satisfaction guaranteed, or money refunded. Address

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Toledo Mill Picks and Stone Tool Mfg. Co.

Manufacturer and Dresser of
MILL PICKS.

Made of the very best double-refined English cast steel. All work guaranteed. For terms and warranty, address

GEO. W. HEARTLEY, No. 297 St. Clair Street,

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N. B.—All Mill Picks ground and ready for use (both old and new) before leaving the shop. No time and money lost grinding rough and newly dressed Picks. All come to hand ready for use.

ALSO MANUFACTURERS OF
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AND MACHINE JOBBING.

HAS BEEN AWARDED
FIRST AND ONLY PREMIUM
AT THE
Millers' International Exhibition.



Office of THE MILLING WORLD.
Buffalo, N. Y., Dec. 3, 1884.

Foreign markets for a few days past have been fairly firm, but so much has been said about manipulation to favor speculation on this side, that the average operator does not seem inclined to trust too implicitly in such reports. Thus it is that not the usual importance is attached to the ruling of the foreign markets. The tide of receipts says the New York *Commercial Bulletin*, taking the movement one day with another, is unexpectedly full; the visible supply statement—at least that of Chicago—shows an unexpectedly large increase. The New York statement may be said to be about what was looked for. The late private cable advices are favorable. The conduct of exporters shows more confidence; they have become active buyers. The "bulls" are paying at the rate of 30c per bushel to get their wheat carried for them. Will England and other wheat buyers compensate them for assuming this burden? The "bulls" paid at the rate of 48c per bushel in 1879-80, and could have taken a handsome profit, March wheat selling as high as \$1.87 1/2. This happened on a big crop that furnished the largest visible supply up to that time on record; but it was in a year made famous by "deal running" and manipulation. The "bears" contend that the market lacks the necessary capitalists to manage such a movement, while the public at large are too spasmodic in their efforts to lift the load.

The flour market has been only moderately active, and, if anything, rather weak, although prices are not quotably lower. Shipping low extras are selling fairly well, also spring wheat patents; selling the mediums is up-hill work. The trade buyers stop with supplying the day's wants. Exporters can get better terms at the West than here. The market for rye flour is fairly active and steady at full prices; supply continues moderate; arrivals more liberal. The market for buckwheat flour is fairly supplied, and \$2.25 is the top for round lots, although \$2.30 has been obtained for exceptional lots of fancy. There is a firm market for mill feed on a fair demand, and moderate arrivals of track stuff.

FOREIGN EXCHANGE.

Sterling was quiet but steady; commercial bills still being comparatively scarce. Posted rates closed at 4.81 1/2 for 60 days' and 4.84 1/2 for demand. The actual rates ranged: At 60 days' sight, 4.80 3/4@4.81; demand, 4.84 3/4@4.85; cables, 4.85 1/2@4.85 1/4, and commercial, 4.79@4.79 1/4. Continental exchange quiet; francs, 5.25 1/2@5.25 and 5.22 1/2@5.21 1/2; reichsmarks, 94 1/2@94 1/2 and 94 1/2@95; guilders, 39 1/2 and 40 1/2. The closing rates were as follows:

	60 days.	30 days.
London.....	4 81 1/2	4 85 1/2
Paris francs.....	5 23 1/2	5 20
Geneva.....	5 22 1/2	5 19 1/2
Berlin, reichsmarks.....	94 1/2	95 1/2
Amsterdam, guilders.....	40	40 1/2

BUFFALO WHEAT MARKET.

Buffalo, Dec. 3, 1884.

Wheat market flat. No. 1 hard offered at 81c; No. 2 78c. No. 1 white 80c; No. 2 red 80c. All our local millers are well stocked up, and there is no disposition shown by speculators to operate at present. Corn, some demand for car loads on track. New mixed offered at 42 1/2c. Oats dull and unchanged; 31@31 1/2c. for No. 2 white on track.

J. McGOWAN & SON.

BUFFALO MARKETS.

FLOUR—City ground clear Northern Pacific spring \$4.50@5.00; straight Northern Pacific spring, \$5.00@5.50; amber, \$5.00@5.15; white winter, \$4.75@5.25; new process, \$5.50@6.00; Graham flour, \$4.00@5.00. Western straight Minnesota bakers, \$1.75@5.00; clear do, \$4.50@5.00; white winter, \$4.75@5.00; new process, \$6.00@6.50; low grade flour, \$2.50@4.00. OAT MEAL—Ingersoll \$5.75; Bannerman's \$6.00; Akron \$6.25. CORN MEAL—Coarse, \$1.00; fine, \$1.10 per cwt. RYE FLOUR—In fair demand \$4.00@4.25. WHEAT—Market quiet. At the Call Board, for No. 1 hard Duluth 82c asked 79 1/2c bid Dec., 84c asked Jan., 86 1/2c asked 85c bid May. Winter wheat easier; sale three car-loads red winter at 82c and one do white at 80c. CORN—Dull. Sales four car-loads yellow at 44c, and three do No 3 at 43@43 1/2c, on track. OATS—Choice

DUFOUR & CO.'S CELEBRATED BOLTING CLOTH.

FIRST AND ONLY PREMIUM
OVER ALL COMPETITORS!
PURCHASE ONLY
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GOLD MEDAL—SPECIAL, 1ST ORDER
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Picks will be sent on 30 or 60 days' trial to any responsible Miller in the United States or Canadas, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is manufactured expressly for me at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every State and Territory in the United States and Canadas.

Send for Circular and Price List.

No. 2 white held at 82c; mixed quotable at 29@30c; white State from wagons 31@34c. BARLEY—Sales twenty car-loads six-rowed State at 65c and ten do No. 2 do at 58c, all on track. RYE—Sale one car-load Western at 59c on track.

PLAIN TALK.

It must be plain to all intelligent business men that millers cannot continue to manufacture flour at these prices, which are relatively ten to twelve per cent. lower than wheat, says the New York *Produce Exchange Reporter*. What is still more important, their flour cannot be sold at the present ruinous low figures, hence it is quite impossible to obey orders from millers to sell at once on arrival. If millers could spend some time here every season, they would learn something to their advantage; they could, by visiting the Exchange, get a better idea of the great growth of the milling industry of the country, and would learn what they will have to compete with in the future. The increase in the milling capacity of the world the past cereal year was not less than ten per cent., and the preceding year it was placed at 13 per cent. During the two years above alluded to the increase in the consumption of the world for human food did not exceed eight per cent., but far more flour has been fed to live stock and used for manufacturing purposes than ever before, hence outside of the large markets on both sides of the Atlantic, there are small stocks, dealers generally fearing to carry their usual stocks; but restore confidence and the change in the situation would be very marked, and the question immediately comes up, how are we to restore confidence? We answer by millers "shutting down" wholly or in part for a few weeks. It seems plain to the writer that such a course is imperative. To continue to send to this coast upwards of 250,000 barrels and sacks of flour per week, and expect merchants to market half of it here is quite impossible, as a like quantity is sent abroad, thus greatly restricting the foreign demand for that remaining here. It appears to us that if millers fully realized the immense increase from year to year in the production of flour, they would see that it is quite impossible for their agents to market it when there is little outlet for it at present.

If they wish to carry it, we have immense facilities for doing so, and at nominal charges outside of the regular interest and commissions. We are glad to learn from the west, south and northwest, that millers have greatly reduced their production; this they will have to do only for a few weeks, when the situation will be better understood and dealers who are afraid of their shadows and carry no stock will be willing to carry their usual stocks, which would soon change the whole situation. The idea in Europe, and with many in this country, that we have a surplus of wheat for export of 200,000,000 bushels, is a very fallacious one. We think the cornucopia of the autumn, which our English friends have expected to be poured out in abundance in British markets at this time and during the winter, can hardly be expected the coming spring, indeed that cornucopia has proved thus far more imaginary than real, the exporting power of this country has been overestimated by more than fifty million bushels, but time only can demonstrate this. The depression during the week has been marked in almost all grades, that in grades above \$3.25 the most conspicuous. Low winter wheat extras in barrels, also choice superfine have been well sustained under a more active provincial demand, but common qualities of both in sacks could not be placed to any extent unless at very unsatisfactory prices. The market as a whole has been very disappointing, and remarkably quiet for the season.

STOCK-RAISING COMPARED WITH GRAIN-GROWING.

Comparisons have often been made between grain farming and stock raising to show the relative profitability of the two systems of farm management, but seldom has the case been more clearly stated than by the *Canadian Stock Breeder*, which pertinently asks: "Why is it that farmers will, year after year, go on cropping their farms to death, and reaping very meagre returns, till they are driven into other lines of business, is difficult to determine. The establishment of cheese factories has done much to correct or rather lessen the tendency toward overcropping, but even dairy farming is not so well calculated to restore land to a state of fertility as is stock raising. The grain farmer spends his energies in getting all he can out of his land during the short space inter-

vening between the beginning of spring work and the end of harvest, or perhaps he may have a few acres of wheat, which he sows in the fall, and after sprouting, waits for the advent of spring to renew its growth. In any event, his farm lies unproductive during the greater portion of the year, while his taxes, the interest on his investment, and his family and household expenses are going on all the time. And with all this his farm is every day becoming less productive. The stock-breeder has his work at hand the whole year around. Some fields must be cropped with coarse grain for winter feed, and these are more than re-fertilized by the product of manure every year. These fields have to be cultivated by the farmer, but his pasture lands only require cultivation at intervals, while, as for the rest of the work, the herd manures the land, reaps the crop, and carries it to market. The crop of the intelligent stock farmer is growing from the 1st of January to the 31st of December, night and day, hour by hour, increasing in value, while every year sees his farm more productive and the breeding herd more richly bred and valuable."

Geo. W. Hartley, of Toledo, Ohio, has had, during the past year, a remarkably large demand for his mill picks, perhaps the largest demand he has had since he has been in business. Evidently he makes a good pick, and also there are a good many millstones yet in use.

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Choice Milling Wheats a Specialty

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DeLOACH WATER WHEELS.

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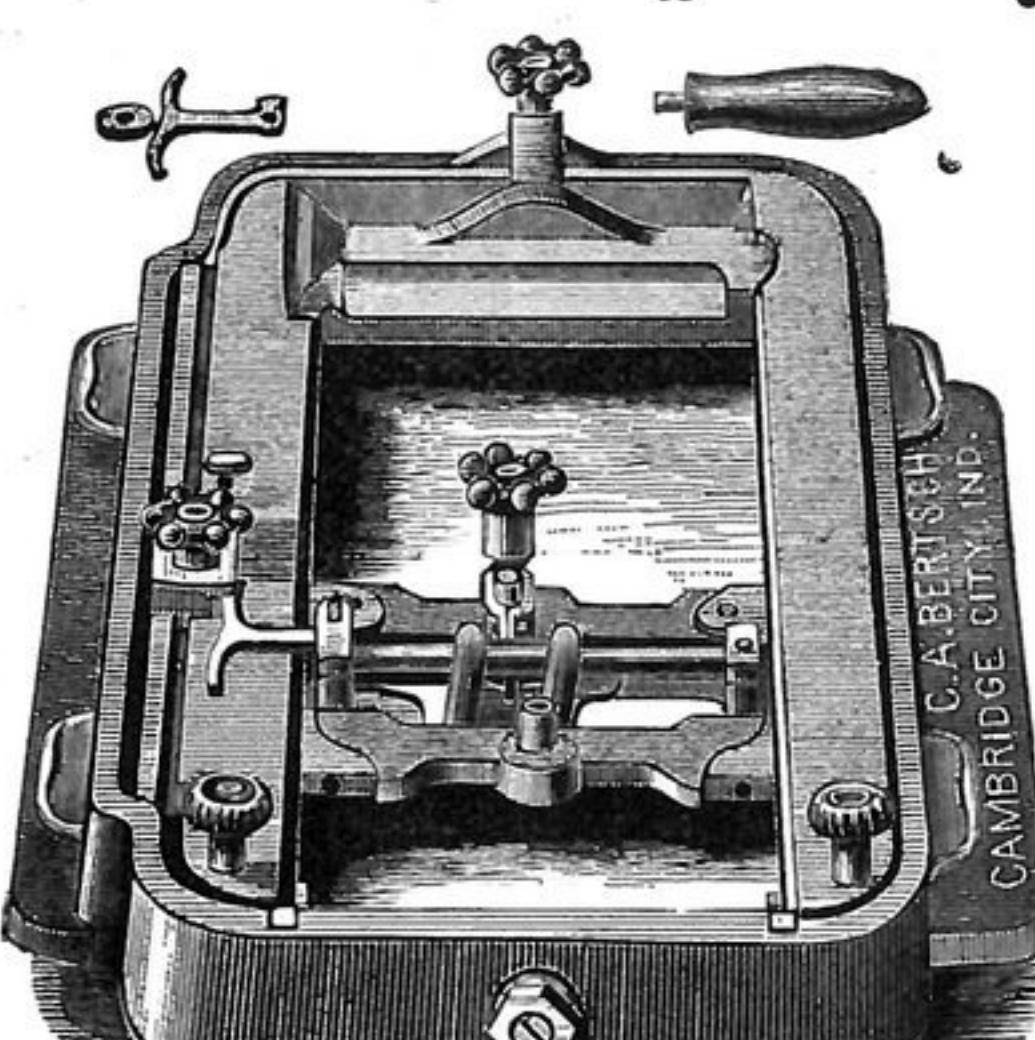
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The A Machine. 29 inches long, 18 inches wide. Weight, 145 pounds. Same width carriage as the B machine.
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A revolution. No Screw Feed, no Ratchet Wheel, Paul Springs or extra Fixtures to contend with. A complete Machine warranted to be much the best and most complete Dresser in the world, will guarantee better satisfaction than any other of its class. Also that more work can be accomplished with less trouble and expense, or otherwise subject to be returned. The best of references given. Machines have been in use over four (4) years, and there has never been a call for any repairs for any machine in use. Parties are surprised as to the merit and simplicity of the machine, and say it is a revolution compared with others. Also as to adjustments which are all accomplished quick and easily by hand without the use of any tool. A positive feed which is similar to a friction feed, the only practical feed ever invented for diamond dresser feed; is instantly reversed to cut right or left while in motion, also to cut fine or coarse. Can cut over one thousand cuts per inch. Consequently can do much deeper facing especially with a dull diamond once going over with one or two diamonds. By finer feeding while in motion, need not raise the diamond on account of a raise or hard spot on the face, in which case it will cut an even depth, also when the diamond is fed to either side of carriage, as it is so constructed. In this so many fail. The machine is ample wide so as to set over the spindle. All the feed mechanism is hard steel. All the wear can be taken up. Specially warranted as represented. State size of burrs. Circulars giving full description forwarded.

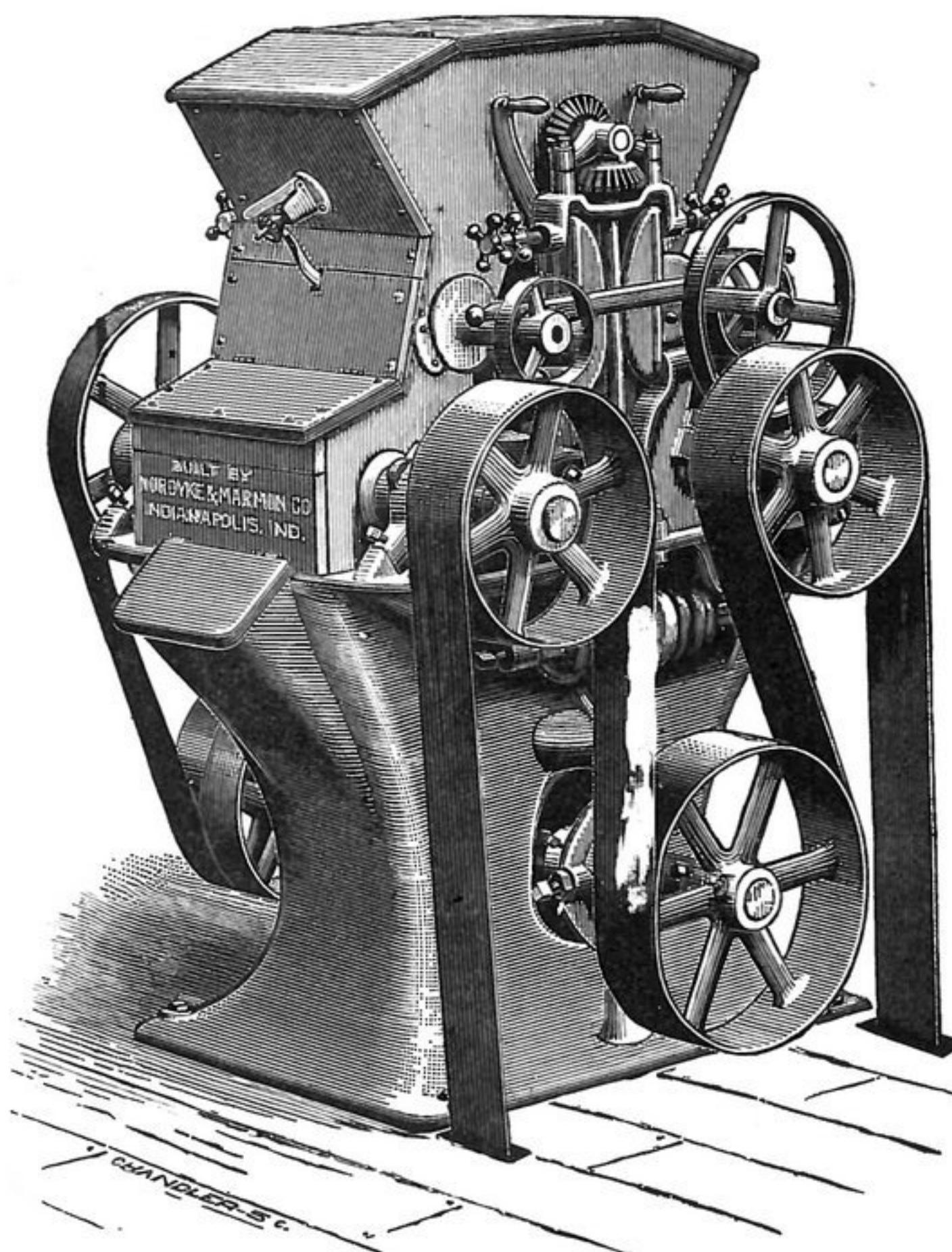
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WE ARE THE SOLE OWNERS FOR THE UNITED STATES OF ALL THE PATENTS UPON THIS ROLLER MILL.



*This Is the Only Roller Mill Made Having All the Essentials
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500 BARREL MILL IN MISSOURI.

Read what an Old Miller who has Thirty-Four Pairs of these Rolls in Constant Use, Says:

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: In regard to the workings of our new mill erected by you, will say it is fully up to and beyond our expectations. Our average work is fully 33 per cent. over your guarantee. Since starting our mill last July we have had no complaint of our flour from any market where sold. It gives universal satisfaction, and we have it scattered on the trade from Chicago to Galveston, Texas. Our yields are all that are attainable. We have tested it on both Spring and Winter wheats with satisfactory results on both varieties. Since the mill was turned over to us we have not changed a spout or foot of cloth, nor have we found it required to make any changes. We have run as long as six days and nights without shutting steam off the engine, not having a "choke" or a belt to come off. The mill is entirely satisfactory to us, and for a fine job of workmanship, milling skill and perfection of system, we doubt if it is surpassed in the United States to-day. It is certainly a grand monument to the ability and skill of Col. C. A. Winn, your Milling Engineer and Designer. You may point to this mill with pride and say to competitors, "You may try to equal, but you will never beat it." Wishing you the success that honorable dealing deserves, I am,

Yours, etc., R. M. FAUCETT, PRES.

OFFICE OF DAVIS & FAUCETT MILLING CO.,

ST. JOSEPHS, MO., Nov. 28th, 1884.

500 BARREL MILL IN ILLINOIS.

MESSRS. NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gents: We started up our mill in June last year, and it gives us pleasure to say that your Roller Mills are doing splendid work and give us no trouble. Your milling program required no changes, and concerning yields, we get all the flour from the offals, and we sell our best grades in the principal markets of the United States at the highest prices offered for any flour. All the machinery made by you is first-class, and we would not know where to purchase as good.

OFFICE OF DAVID SUPPIGER & CO.,

HIGHLAND, ILL., Jan. 10, 1884.

Yours respectfully, DAVID SUPPIGER & CO.

125 BARREL MILL IN INDIANA.

NORDYKE & MARMON CO., INDIANAPOLIS, IND.

Gentlemen: The 125 barrel All Roller mill you built us has been running all summer, and does its work perfectly. Before contracting with you for this machinery we visited many Roller Mills throughout the West and Northwest, built by the different leading mill furnishers, and from all we could see, those built by you seemed to be giving the best satisfaction, and this is why we bought our machinery of you. Our mill comes fully up to your guarantees, and the capacity runs over your guarantees. The bran and offal is practically free from flour, and our patent and bakers' flour compares favorably with any we have seen elsewhere. I don't think anyone can beat us. Your Roller Machines are the best we have seen; they run cool, and the interior does not sweat, and cause doughing of the flour. Judging from our success, we would recommend other millers to place their orders with you.

LAPEL, MADISON COUNTY, IND., Jan. 10, 1884.

Yours truly, J. T. FORD.

Letters on file in our office from a large number of small roller millers giving as favorable reports as above. A portion will be published as occasion demands.

SPECIAL MILLING DEPARTMENT!
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Drag Brush Feed, Tightest Heads, Best Results. Cheapest and Best on the Market. Adapted to all Kinds of Milling. The New Drag Feed Thoroughly Protects the Silk. Sent on Trial to any Responsible Miller.

ROLLER MILLS, SCALPING REELS, PULLEYS, SHAFTING AND ALL KINDS OF MILL IRONS.

Full Stock of Dufour and Dutch Anchor Bolting Cloth.

BEST QUALITY FRENCH BURR MILLSTONES, FOR MIDDLING, WHEAT AND FEED. Leather, Rubber and Cotton Belting, Smut Machines, Purifiers and everything belonging to a Flour Mill furnished at Lowest Market Prices. For Circulars, Prices and Full Particulars, address the Manufacturer,

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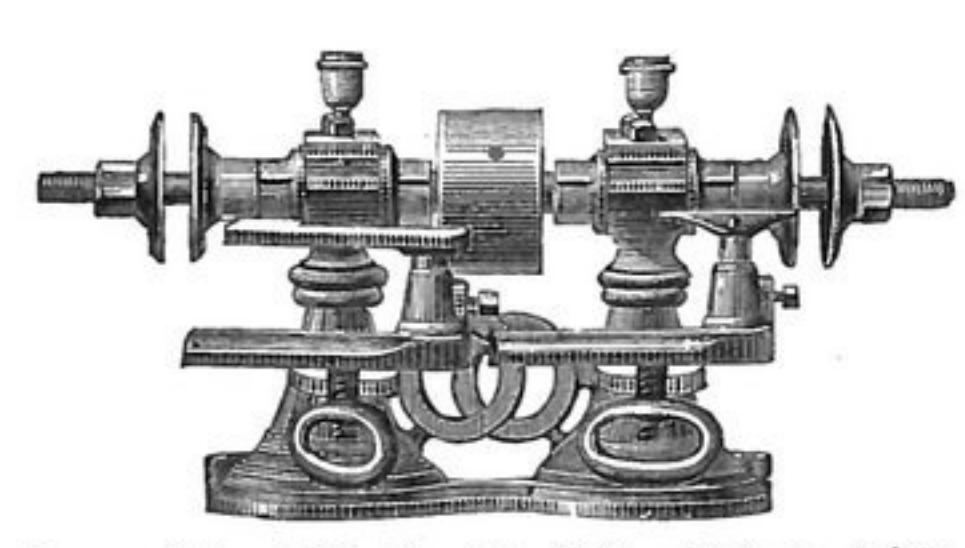
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This is a new article of manufacture, and is greatly superior to the preparations now in common use, containing nothing of a poisonous nature. It has the nature and attains the hardness of stone, and assists in grinding. Good Millstones are now in use, composed entirely of this preparation. For miller's use, it is put up in cases of two sizes. Price per case: Small, \$3.00; Large, \$5.00. For manufacturers, the Furrows and



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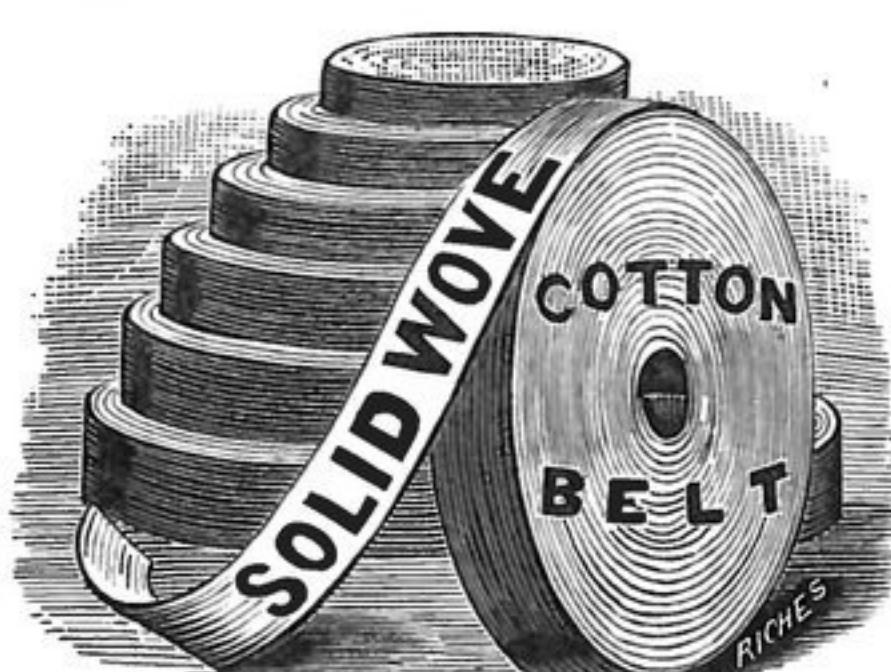
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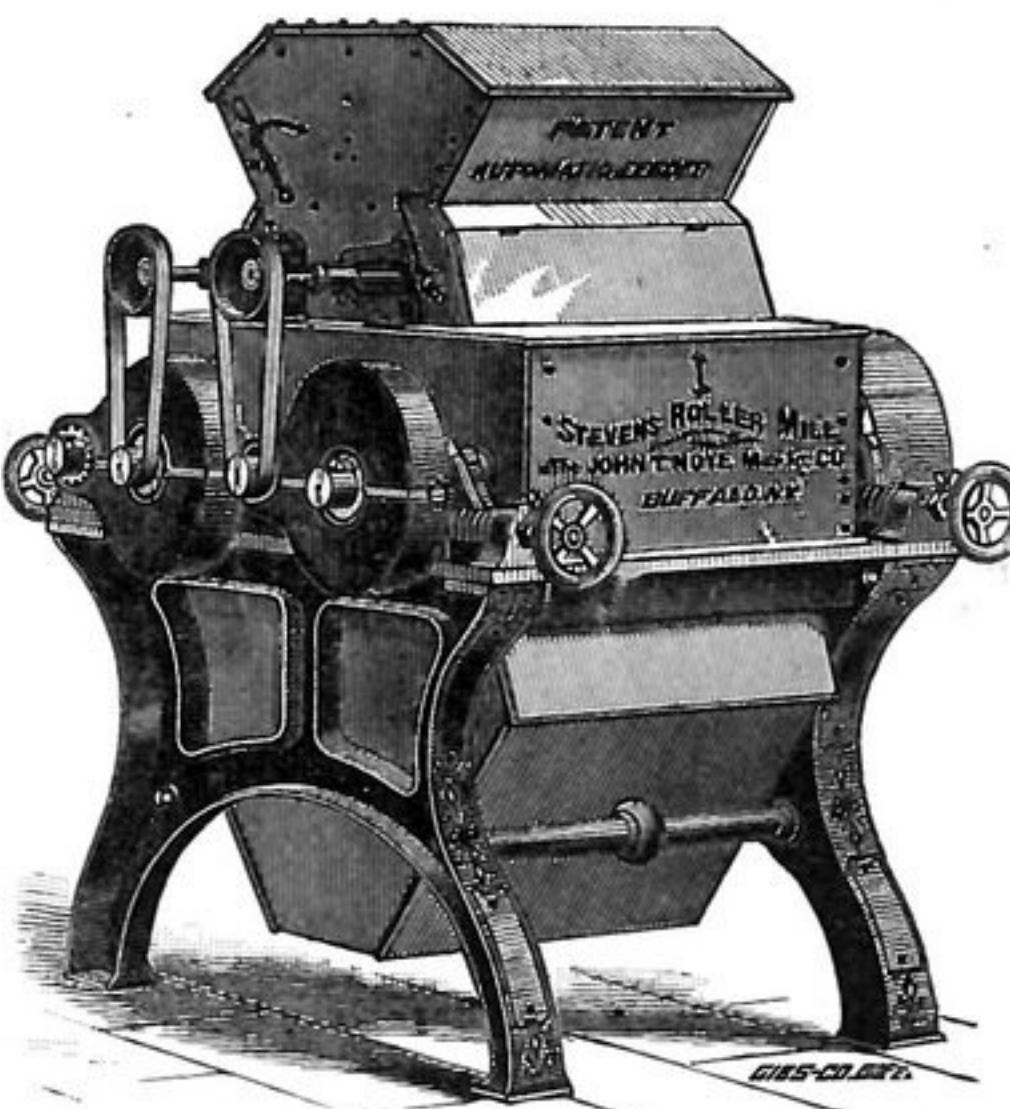
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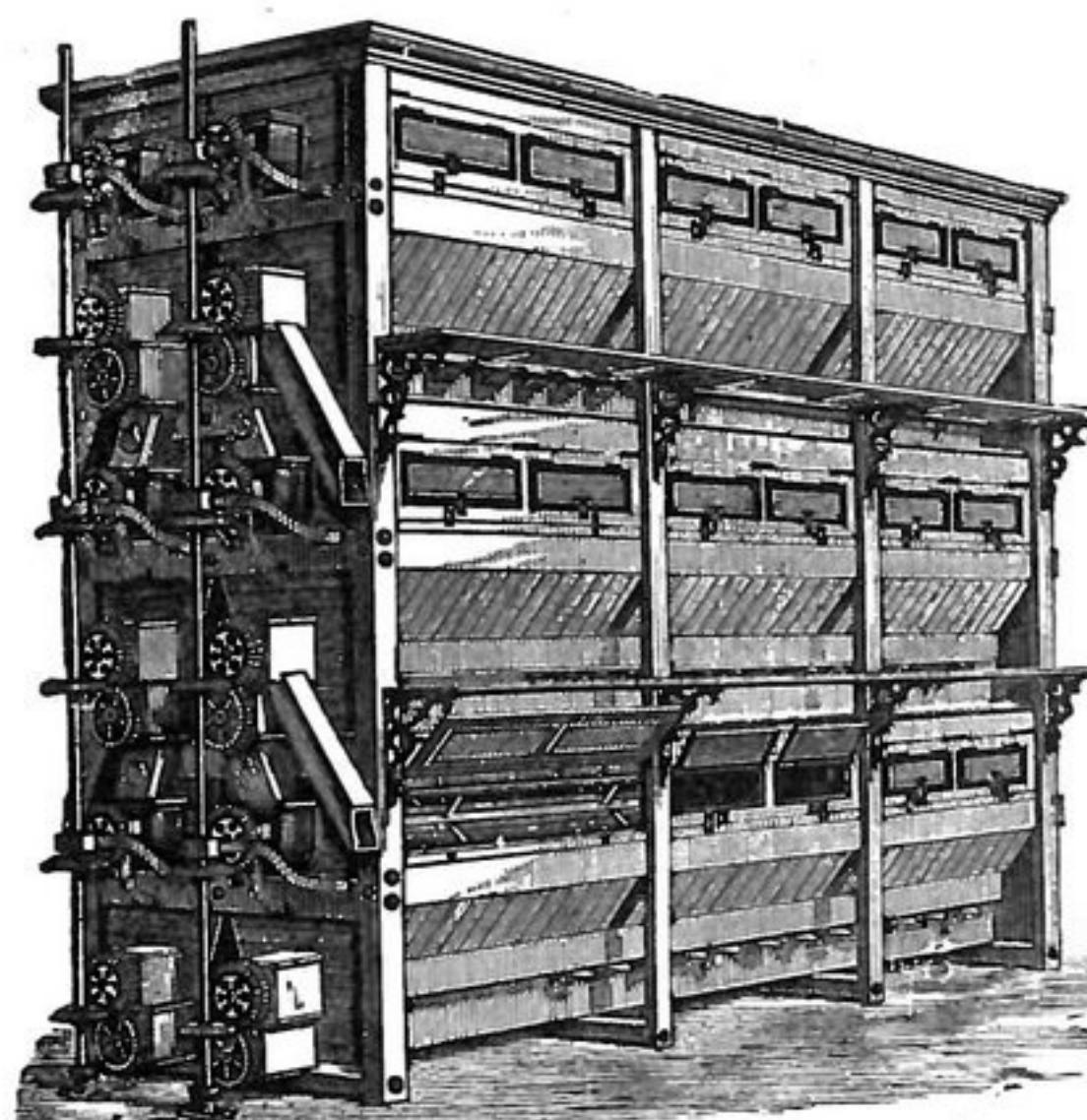


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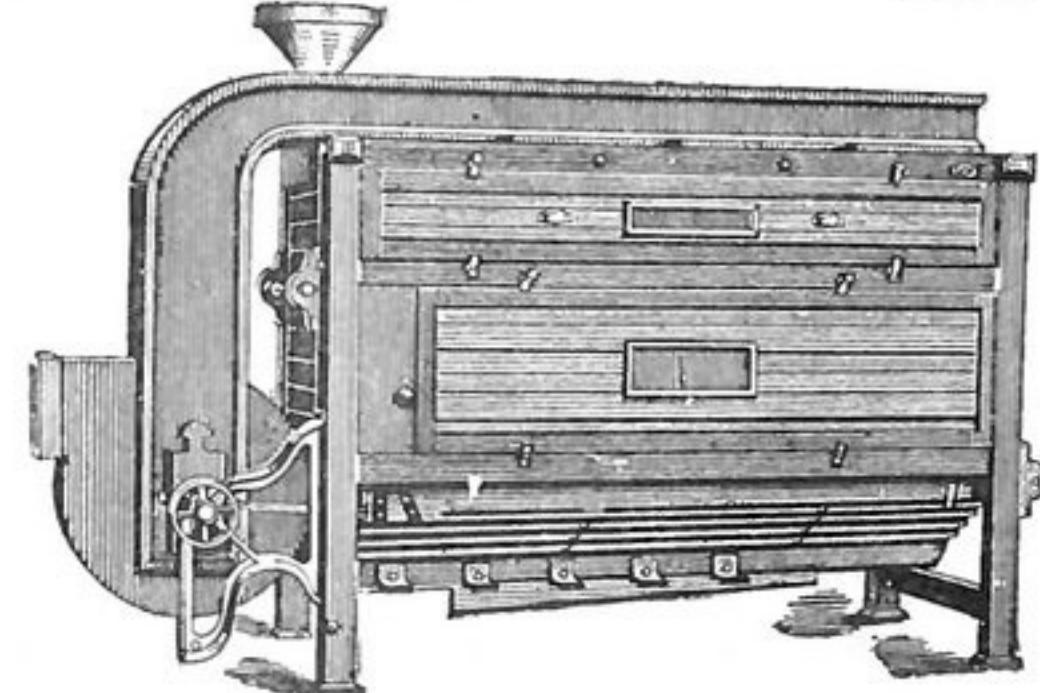
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